

DESCRIPTION FOR PURCHASE

FIRE SUPPRESSION REFILL SYSTEM (FSRS)

1. SCOPE

1.1. Scope. This specification describes a set consisting of selected tools and equipment used to refill the majority of fire suppression systems currently fielded by the military. These systems include both man portable systems as well as the fire suppression systems that can be found in military vehicles. The set will utilize the current transportable, rapidly deployable, highly mobile, trailer mountable Standard Automotive Tool Set (SATS) International Organization for Standards (ISO) tactical container to house the equipment. The set will also use the current SATS Environmental Control Unit (ECU) to maintain a suitable environment within the container.

AMSC N/A

FSC 4940

DISTRIBUTION STATEMENT A. Approved for public release: distribution is unlimited.

2. APPLICABLE DOCUMENTS

2.1. General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. This section lists documents related to integration of the equipment and container. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2. Government documents.

2.2.1.Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see paragraph 6.2).

SPECIFICATIONS

FEDERAL

- | | |
|------------|---|
| A-A-59486A | - Commercial Item Description (Padlock Set) |
| A-A-50271 | - Plate, Identification |
| UN 1956DOT | - Shipping compressed gases |
| DOT-4BW400 | - Cylinder Rating |

STANDARDS

FEDERAL

- | | |
|-------------|---|
| FED-STD-595 | - Colors Used in Government Procurement |
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DEPARTMENT OF DEFENSE

MIL-STD-129P	- Standard Practice for Military Marking
MIL-STD-171	- Finishing of Wood and Metal Surfaces
MIL-STD-810	- Environmental Test Methods and Engineering Guidelines
MIL-STD-130	- Identification Marking of U.S. Military Property
MIL-HDBK-784	- Guidelines on designing to minimize contamination and to facilitate decontamination of military vehicles and other equipment
MIL-STD-2073-1D	- Standard Practice for Military Packaging

PAMPHLETS

DEPARTMENT OF THE ARMY

DA PAM 40-501	- Hearing Conservation Program
Army Pamphlet 611-21	- Military Occupational Classification and Structure

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

2.2.2. Other government documents, drawings, and publications. The following other government documents, drawings, and publications form a part of this document to extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

PURCHASE DESCRIPTIONS

DFP 420	- SATS Description for Purchase (DFP)
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2.3. Non-government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents that are DOD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see paragraph 6.2).

ACOUSTICAL SOCIETY OF AMERICA (ASA)

ASA S1.4	- Specification for Sound Level Meters
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(Application for copies should be addressed to the Acoustical Society of America (ASA), 120 Wall Street, 32nd Floor, New York, NY 10005-3993.)

AMERICAN NATIONAL STANDARDS INSTITUTE

ANSI Z535.4	- Product Safety Signs and Labels
ANSI/CGA G-7.1	- Commodity Specification for Air
ANSI Z87.1	- American National Standard Practice for Occupational and Educational Personal Eye and Face Protective Devices

(Application for copies should be addressed to the American National Standards Institute, 11 W. 42nd Street, New York, New York 10036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM SI 10	- Standard for Use of the International System of Units (SI): The Modern Metric System
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ASTM-D5445	- Pictorial Marking for Handling of Goods
ASTM-D4675	- Selecting and Use of Flat Strapping Materials
ASTM-D4169	- Performance Testing of Shipping Containers and Systems

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pa 19428-2959.)

COMPRESSED GAS ASSOCIATION

CGA Pamphlet G-7	- Compressed Air for Human Respiration
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(Application for copies should be addressed to the Compressed Gas Association, 4221 Walney Rd 5th floor, Chantilly, VA 20151.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO/IEC 16022	- Data Matrix characteristics
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(Application for copies should be addressed to ISO Central Secretariat, International Organization for Standardization (ISO), 1, ch. De la Voie-Creuse, Case postale 56, CH-1211 Geneva 20, Switzerland)

NATIONAL FIRE PROTECTION ASSOCIATION

NFPA 1901, 2009 Edition	- Standard for Automotive Fire Apparatus
NFPA 10, 2007 Edition	- Standard for Portable Fire Extinguishers

(Application for copies should be addressed to NFPA, 1 Batterymarch park, Quincy, MA 02169-7471)

2.4. Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1. Disclaimers and notices.

3.1.1. First article. When specified, a sample shall be subjected to first article inspection in accordance with paragraph 4.2.

3.1.2. Pictorial representations. The figures in this DFP represent a possible design concept. The use of any particular image does not imply that the government has a preference for a specific brand of tool, nor does it imply that the tool in the image automatically meets our requirements, especially as they relate to those requirements driven by law regarding tools that must be made inside the United States or its territories or any other governing rules, regulations, and laws. The controlling requirements for the FSRS and its tool load are the text requirements of this DFP; the figures are included only for additional clarity. It is the responsibility of the manufacturer to ensure that each item offered meets all of the requirements related to the item.

3.1.3. Possible source of supply. In order to help clarify the government's requirements, actual items available in the commercial market place which might possibly be used to meet requirements have been included along with text describing the items. The use of any possible item does not imply that the government has a preference for a specific brand of item. Due to the fluidity of the commercial marketplace, the government cannot guarantee the availability or the performance of the possible items. It is the responsibility of the suppliers and manufacturers to assure that each item offered meets all the requirements stated in the text of this document.

3.1.4. Design. The design illustrated in Figure 1, Figure 2, and Figure 3 in Appendix A are possible locations for the equipment. Equipment locations for this design were based on Center of Gravity (CG), anticipated

transport/handling modes, ease of use, and equipment co-dependency. Although an alternate design may be utilized, all of these considerations must be taken into account on any new design. A prototype FSRS was built and tested, so proven installation methods are available. If alternate installations methods are utilized the contractor will be responsible for addressing how the alternate installation methods are as strong, or stronger, than the prototype installation methods.

3.1.5. Industrial/Professional quality tools. The components listed in Section 3.12 shall be industrial or professional quality. For the purposes of this procurement, the term “industrial/professional quality tools” versus household-use tools or general purpose tools is defined as tools commercially marketed and manufactured for constant, rigorous, industrial or professional environment use, and that have demonstrated market acceptance. Proof of industrial quality shall be provided as stated in section 3.1.5.1.

3.1.5.1. Market acceptance. In the event that the government is unable to determine from the offered product literature and associated information that a product meets the requirement for industrial/professional quality tools and discussions are therefore opened, offerors shall be prepared to offer evidence of market acceptance in the industrial or professional market. Evidence of acceptance by industrial/professional customers includes sales to fleet operators, distributors, contractors, industrial and professional users, and sales to distributors who retail exclusively to the industrial or professional market. Advertising or marketing literature that indicates “industrial grade” or “professional quality,” or merely stating that an item is “industrial grade” or “professional quality” is insufficient to establish industrial/professional quality since these are terms for which there is no generally acceptable definition. A claim that an item is manufactured to an industry consensus standard is also insufficient to establish industrial or professional quality.

3.1.6. Dimensional requirements. The GFM container has an internal length of 185 inches and an internal width of 86 inches. If the contractor chooses to install equipment along both sidewalls, facing a center aisle, the aisle may be reduced to no less than 25 inches to allow for safe movement and operation within the container.

3.1.7. Government Furnished Materials (GFM). The contractor shall be provided with one 8’ x 8’ x 20’ ISO container and a standard kitchen trailer used for transport. This GFM container and trailer shall be the container and trailer that are currently used by the SATS. A better description of the container and trailer can be found in DFP 420 (SATS DFP). The GFM container will be furnished with one Nordic Air (Model: GS1H43ZAANWY001) 18,000 BTU Environmental Control Unit (ECU). The furnished ECU will be the model used in the current SATS. The ECU will be delivered to the contractor already installed in a mechanical room near the front of the GFM container. All other equipment in this DFP, including the tool load, shall be supplied by the contractor. No other items will be provided as GFM for the construction of the FSRS.

3.2. Deployment and transportability.

3.2.1. Configurations. The FSRS shall have a transport/storage mode and a deployed mode.

3.2.1.1. Transport, handling, and storage. When the FSRS is in transport/storage mode all equipment shall be inside the container and all restraining provisions shall be in place. While in transport/storage mode the system shall be suitable for commercial and military shipment via sea, rail, and highway while the container is either trailer mounted or dismounted. The trailer and container shall each be suitable for commercial and military transport by air. The container shall be shipped and stored long term with all of the chemicals removed.

3.2.1.1.1. Shock and vibration. In transport mode, the FSRS container and equipment shall withstand the shocks and vibration associated with commercial shipment as secured cargo without sustaining damage or degradation in performance. During shipping, the systems components, accessories, parts, or tools shall not be damaged or displaced.

3.2.1.1.2. Rail transport. In transport mode, the FSRS container and equipment shall withstand the shock and vibration imparted by coupling rail cars at impact speeds up to 8 miles per hour (mph) without damage to the container, equipment, or displacement of the equipment in the container.

3.2.1.1.3. Air transport. The GFM container is suitable for transport by the U.S. Air Force C130 and larger cargo aircraft, and no modifications shall be made to the FSRS container that may hinder this capability. The GFM container will be provided with a vent to prevent damage due to emergency decompression of the aircraft. The vent is currently located inside the man door on the wall to the right, approximately 2 inches from the man door wall with the bottom approximately 57 inches from the floor. Modifications to the FSRS container shall neither alter nor interfere with the operation of this feature, and the vent shall not be blocked. The center of balance markings of the loaded FSRS shall be in compliance with 5.2 of MIL-STD-129P and ASTM-D5445.

3.2.1.1.4. Military ground transport. The fully loaded trailer-mounted FSRS shall be suitable for transport by an Army M1083 tactical cargo truck as a towed package.

3.2.1.1.5. Ground mobility. When loaded with the tools and equipment specified herein, the FSRS container and tool load shall have the durability to withstand being transported over a variety of surfaces including 30% on primary roads, 65% on secondary roads, and 5% on open cross-country. The surfaces traversed shall include various states of disrepair that may be encountered worldwide, including bumps, cobblestone, and washboard. During or following the travel, there shall be no damage to, or displacement of, any component, accessory, part, or tool installed in or on the shop and no evidence of damage to the container. Maximum safe speed for the surface and conditions shall be maintained; not to exceed 50 mph on primary roads, 35 mph on secondary roads, and 15 mph for travel cross-country. (See Section 6 of SATS DFP 420 for definitions, drawings, and descriptions of road types).

3.2.1.1.6. Weight. The gross weight of the fully loaded FSRS system with the SATS kitchen trailer shall not exceed the 21,000 pound maximum towing capacity of the Army M1083 or the 15,000 pound maximum gross weight of the GFM container. The current SATS kitchen trailer weighs approximately 6,600 pounds.

3.2.1.1.7. Balance. When prepared for transport, the weight of FSRS trailer-mounted container shall be properly balanced. The center of gravity (CG) shall be within 6 inches of the longitudinal centerline of the shop container and so located that, when trailer-mounted, the lunette/pintle load is not less than 1,050 lbs and not more than 2,100 lbs. The CG of the loaded FSRS trailer-mounted container in transport mode shall be at a height producing a trailer Static Stability Factor (one-half the track width divided by the height of the CG) of at least 0.75.

Vehicle Towing Capacity			
Vehicle	Max Trailer GVW	Max Pintle Weight	Pintle Height
M1083	21,000	2,100	36"

3.2.1.2. Deployed. When the container is deployed, items such as the air compressor may be removed from the container. The compressor shall also be capable of receiving power from the container as well as provide compressed air to the inside of the container while the container is sealed. The GFM container may only be altered to utilize the pass through area as shown by Figure 4 in Appendix A. The available power/air pass through area is a 10" x 10" area located on the same side as the power distribution panel. The center of this 10" x 10" area is located approximately 56.5" from the front of the container and 44.5" from the bottom of the container (see figure 4 in Appendix A).

3.3. Inputs and interfaces.

3.3.1. Human interface. The FSRS shall be suitable for setup, operation, and maintenance by personnel who's Military Operational Specialty (MOS) has a physical demand rating of "Heavy" as defined in Army Pamphlet 611-21. (See Appendix D of the SATS DFP 420 for further information of MOS physical demand ratings) The outside of the GFM container is currently operable and maintainable by personnel wearing heavy gloves and clothing suitable for cold weather. Any modifications to the FSRS container shall maintain this capability.

3.3.2. Protective clothing. No special considerations must be made for winter clothing on equipment inside the container. Any equipment that is moved outside of the container for operation must be operable by personnel wearing heavy gloves and clothing suitable for cold weather.

3.3.3. Electrical container interface. The container will be provided with a fully operational electrical system including lights and outlets. The current location of the lights and outlets in the GFM container are shown by Figure 5 in Appendix A. The contractor may make minor modifications to the current GFM container electrical system to improve the integration of the tool load into the set. Possible modifications to the containers electrical system may include moving outlets, installing additional breakers for equipment, and integrating the electrical equipment into the container for the compressor outlined in sections 3.12.13. Any modifications to the container's lighting system must satisfy section 3.3.2.2 in the SATS DFP 420. It is the responsibility of the contractor to ensure that equipment that must run at the same time is capable of doing so as well as running the ECU at full capacity without causing any sort of uncontrolled loss of power, commonly referred to as a brown out. All components and regulating devices outlined in section 3.12. shall be compatible with the electrical outlets that provide them power.

3.3.4. Plumbing interface. The contractor shall install a fully integrated plumbing system that connects the appropriate pieces of equipment to one another. Shortly after the main source air line enters the container the plumbing shall separate into a minimum of two runs. One run shall supply the equipment required to refill and recover HFC-227. Another run shall supply the equipment required to refill dry chemical bottles. The airlines that supply the pneumatic vise, nitrogen generator, and any ancillary equipment may be attached to either the HFC-227 run, the dry chemical fill run, or plumbed separately using additional runs that separate from the main source air line. It is desired that the nitrogen generator is plumbed separately using an additional run that separates from the main source air line, but it is not required. Each run that separates from the main source air line shall include a valve that is positioned at a conspicuous location on the interior of the container as close as practical to the separation point. This will minimize the chance of damaging the air line before the shutoff valves. The system shall be designed so that if one valve is turned off the operator can still fill/recover either HFC-227 bottles or dry chemical bottles. One of many acceptable configurations is shown in Figure 6. Plumbing between components shall be designed so that they can be removed/replaced without disassembly/removal of the component(s) themselves. All components and regulating devices outlined in section 3.12. shall be compatible with each other and the air sources that feed them. The plumbing shall be appropriately sized to allow each piece of equipment to operate at maximum capacity.

3.3.5. Size. When ready for transport, the overall height and width of the FSRS container shall not exceed 96 inches and the overall length shall not exceed 240 inches. No part mounted to the container shall extend beyond the planes defined by the outer surfaces of the container corner blocks.

3.3.6. Task loading. The tasks required to prepare the FSRS for ground transport after operation, and likewise to prepare it for operation after ground transport, shall not require two soldiers more than 1.5 hours. This set up time does not include the time required to fill the storage containers to their operational capacity.

3.3.7. Security. All openings of the container shall be lockable by use of padlocks which conform to Type I of Commercial Item Description A-A-59486A.

3.3.8. Plates and labels. All identification, warning, and instruction plates and labels shall be permanently affixed to the FSRS container or individual components, as appropriate. They shall be resistant to deterioration caused by heat, cold, solar radiation, water, and petroleum products to the extent that they will remain intact and readily legible for the expected economic life of the FSRS. Marking shall be accomplished in a manner that does not adversely affect the life and utility of the FSRS container or its equipment. All human readable plates and labels shall be printed in the English language, and may be supplemented by graphical symbols.

3.3.8.1. Item identification. A human readable information plate conforming to A-A-50271, Composition A, Class 2 or Composition D, and containing the following data shall identify each FSRS container. The item identification shall be placed in a location on the exterior of the FSRS container that is plainly visible when the FSRS container has been closed in preparation for transport or storage.

Nomenclature: (to be identified by contract/delivery order)

NSN: (to be identified by contract/delivery order)

LIN: (to be identified by contract/delivery order)

d. Specification data: DFP ECB-047 CAGE: 5B5M3

e. Manufacturer: CAGE or NSCM and PIN **

f. Serial Number: *

g. Acquisition instrument identification number: **

* Format optional

** See definitions

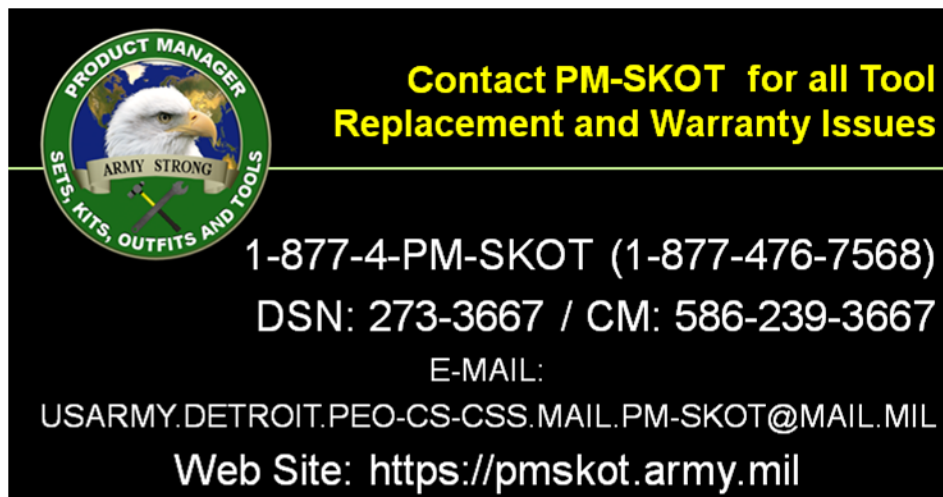
3.3.8.2. Shipping data. A human readable shipping data plate shall be attached to each FSRS container and shall conform to A-A-50271, Composition A, Class 2, or composition D. Silhouettes of the FSRS container in transport configuration that indicate the center of gravity of the fully-loaded trailer-mounted container along each axis as well as the locations of the lifting and tie-down provisions shall be included on the data plate. A separate shipping data plate shall provide the same information for the fully-loaded, dismounted container. The shipping data plates shall be placed in a location on the exterior of the FSRS that is plainly visible when the FSRS container has been closed in preparation for transport or storage.

3.3.8.3. Hazard identification. Unguarded physical hazards (see section 3.6.1) shall be identified by human readable information plates. Chemical storage location labels (section 3.4.2.) shall be accompanied by warnings that caution the operator from mixing the labeled chemical with other chemicals in the FSRS (section 3.6.7) that may cause a hazardous condition. A sign shall be posted near the HFC-227 recharge station (section 3.12.1) that cautions the operator from storing HFC-125 in the container if temperatures are expected to reach 120F or greater. Product safety signs and labels shall conform to ANSI Z535.4.

3.3.8.4. Noise hazards. If the steady-state noise produced by the compressors or other FSRS components in any mode of operation exceeds 85 decibels (dB) on the A-weighted scale, noise hazard caution signs that require the operator to wear hearing protection shall be posted on the compressors or other components in a conspicuous location.

3.3.8.5. Lift hazards. Caution signs shall be provided for stored items that exceed the safe limits for a single person to lift using both hands (See Appendix D of SATS DFP 420).

3.3.8.6. Warranty information. A human readable warranty information plate at least 5 inches wide and 2.5 inches high shall be supplied by the Government for the contractor to affix to each FSRS container. The warranty information plate shall be located in a conspicuous location on or near the personnel door and shall conform to the following image. In the event the warranty information plate changes, the government shall furnish the new label design.



3.3.8.7. Unique Item Identification (UID). Each FSRS shall be marked with a Unique Item Identifier (UID) that has machine-readable data elements distinguishing it from all other like and unlike items in accordance with MIL-STD-130 (see note 6.5). Each UID shall be globally unique and unambiguous. The UID data elements shall be

contained in a Data Matrix ECC200 symbol in accordance with ISO/IEC 16022. Any component of the FSRS for which the cost to the Government will exceed \$5000, and all GFM, shall be marked with a UID (see section 5.11. for more information on GFM UID markings). The contractor shall bear the responsibility to update the UID registry with the parent (end item) and children (component) UIDs. Further guidance on UID may be found at <http://www.acq.osd.mil/dpap/uid/>.

3.4. General storage.

3.4.1. Easy access. All equipment and expendable supplies in the FSRS container shall be accessible by personnel standing inside the container (stooping and bending are permitted). To accommodate standing operation for personnel, the distance from the floor to any overhead obstruction inside the container shall be at least 76 inches when in operational mode.

3.4.2. Organized storage. Each item carried in the FSRS shall have a specifically designated storage location. Special precautions must be taken to ensure that the locations where chemicals are expected to be stored in the container are labeled prominently to reduce the chance of filling a bottle with the wrong chemical. Extra precautions must also be taken to make sure that chemicals that will react with one another are stored in such a manner that they will not come in contact during regular duty operation. The contractor is not responsible for supplying the FSRS with chemicals, but they are responsible for properly marking a location for these chemicals in the quantity outlined in section 3.6.7.

3.4.3. Visual cues. The storage method used for each item shall provide the operator a visual cue when an item is not in its designated storage location. Possible solutions for visual cues on smaller equipment/accessories include using foam inserts in drawers/cases that have cut outs that accommodate a specific tool/accessory. If this method is employed, additional foam material should be removed to allow the operator to get their fingers around the tool to remove it from the recessed area. If foam is used for visual cues, the foam assemblies shall consist of a single solid 0.125" red bottom layer that is cross-linked closed cell polyethylene foam manufactured to A-A-59135 Class 1 Grade A (general purpose polyethylene sheet material, standard) with a density of 8 pounds for the bottom layer with subsequent tool retention layers consisting of black cross-linked closed cell polyethylene foam manufactured to A-A-59135 Class 1 Grade 1 with a density of 2 pounds. Different combinations of foam colors may be approved upon request. A possible solution for identifying larger equipment/storage media may include creating outlines on the floor to designate the name and location of equipment/storage media.

3.4.4. Rapid inventory. The integration of the FSRS equipment and containers into their respective locations shall facilitate rapid inventory. The storage methods employed shall provide a probability of at least 0.8 that the operator can verify that all items are present and secured in their designated storage locations within 2 hours. In the event an item is absent from the shop, the operator shall be provided with the means to identify the specific item by name and description. There shall be a probability of at least 0.8 that any missing item be identifiable by name and NSN; or by name, part number, and supplier's CAGE code; within three minutes.

3.4.5. Multipurpose storage. General storage shall also be made available near the HFC-227 recharge area and the dry chemical fill area for expendable items like o-rings and adaptors to fit the different fire suppression bottles. The storage media shall protect the specified items during transport and shall also make them easily accessible during operation. The general storage media shall also have extra compartments for additional adaptors and o-rings that may be required when the system is fielded. These additional compartments are not required to be labeled or provide visual cues as specified in section 3.4.3.

3.4.6. Linear Products. Flexible linear products more than ten feet long, such as hoses and electrical cords, should be stored on reels or looms when possible. Straps, ties, or other devices shall be provided for linear products not stored on reels or looms to permit them to be stored and hand-carried in neat coils. Hoses or other flexible linear products that have one end permanently affixed to the equipment and the other end used for operation shall have a strap, tie, or other device to secure these items when they are not in use. This requirement does not apply to linear products that are permanently mounted within the container.

3.4.7. Proximate storage. Items normally used together shall be stored in the same area of the FSRS container, making sure to comply with section 3.4.2. of this document. The FSRS provides fire suppression refill equipment

that is often used in conjunction with specific chemicals, fittings, or other equipment so these items must be stored in close proximity to one another to facilitate rapid refill. The following task-oriented groupings of refill equipment are provided as examples.

HFC-227 and Halon1301 fill and recover – Tools, equipment, and plumbing required to fill fire bottles with HFC-227, or functionally equivalent gases, as well as recover Halon 1301, or functionally equivalent gases. Some items include HFC-227 recharge station, Petrotech 25, HFC-227/FE-227/FM-200 cylinder, Halon 1301 cylinder, recycled Halon 1301 cylinder, bench scale with a bottle holder, nitrogen supply with regulator, air supply with regulator, remote fill hose, storage for HFC-227 adaptors, and the kit for maintenance on the recharge station.

Dry Chemical fill – Tools, equipment, and plumbing required to safely fill fire bottles with the necessary dry chemicals. Some items include a dry chemical fill system, a dry chemical storage media, down draft table, bench scale, dry chemical funnel attachment, nitrogen supply with regulator, air supply with regulator, sodium bicarbonate, mono-ammonium phosphate, ansul plus fifty C powder, black widow dry chemical, Purple K, distilled water, eye wash station, and a storage media for the dry chemical fittings.

Nitrogen generation – Tools, equipment, and plumbing required to generate and store nitrogen. Some items include a nitrogen generator, a nitrogen storage media, and an air supply with a regulator.

CO₂ fill – Tools, equipment, and plumbing required to store CO₂ as well as fill CO₂ bottles. Some items include a CO₂ pump, CO₂ storage media, scale with bottle holder, air supply with regulator, and a belt vise.

3.5. Environment.

3.5.1. Environmental requirements. The FSRS shall be operable in temperatures ranging from -25F to 120F in tropical, desert, temperate, and sub arctic climate conditions. The FSRS shall withstand storage conditions ranging from -50F to 160F in the same climate conditions. During operation, the inside of the container must be capable of maintaining a constant temperature of 70 degrees using the Government furnished ECU, to facilitate the filling of fire suppression equipment.

3.5.2. Corrosion protection. Metal that is attached to the inside of the trailer to secure equipment shall be painted or coated to match the inside of the container. The paint or coating must be capable of protecting the material from corrosion over the life of the system.

3.5.3. Weather protection. Modifications to the container attendant to the installation of FSRS components shall not degrade the containers ability to protect its contents from rain, accumulation of ice and snow, and accumulation of dirt, dust and mud.

3.5.4. Interior environment. The GFM container will be provided with a GFM ECU (a combination heater and air conditioner) that is capable of supplying 18,000BTU cooling and 14,000 BTU heating. Any modifications that are made to the GFM container must not prohibit the container from holding a constant interior temperature of 70°F when subjected to the conditions outlined in section 3.5.1. of this document.

3.5.5. Fungus, mildew, mold, and moisture. All hoses, electric cable covers and other elastomer parts that are exposed to air shall be fungus, mildew, mold, and moisture resistant.

3.5.6. Ozone. All hoses, electric cable covers and other elastomer parts exposed to air shall be ozone resistant.

3.5.7. Survivability. The FSRS must meet the following conditions to be survivable in the battlefield environment.

3.5.7.1. Protective coloration. For concealment, the exterior of the trailer-mounted container shall be provided with a color scheme that will blend in with the operational environment. Camouflage patterns supplied by the Army shall not be altered. Brackets or other hardware attached to the container exterior shall be coated to match the camouflage pattern in that area.

3.5.7.2. Blackout conditions. When all doors and opening are closed, the GFM container is light tight. The GFM container is also provided with an interlock that opens the electrical circuit(s) for the interior lights so that the white lights are completely extinguished and replaced with NVD-safe lighting before the light-tight seal of the entryway is broken. Modifications to the container attendant to the installation of FSRS components shall neither alter nor interfere with the operation of these features.

3.5.7.3. Nuclear, Biological, and Chemical Contamination Survivability. The integration of the FSRS equipment shall not degrade the NBC survivability characteristics of the GFM container.

3.6. Safety. The FSRS shall not present any uncontrolled safety or health hazards throughout the life cycle of the system. The FSRS shall incorporate the following features to assure safe operation.

3.6.1. Physical hazard control. Mechanical guards, electrical insulation, thermal insulation, and other safety devices shall be provided to protect operators and maintenance personnel from inadvertent contact with moving parts, electrically energized parts, high temperature surfaces, and other physical hazards (See Appendix D of SATS DFP 420). The safety devices shall not interfere with operation of the FSRS. Exposed sharp corners and sharp edges on FSRS parts shall be eliminated if they serve no functional purpose. In addition, components and or plumbing that require periodic recertification or replacement shall be clearly identified. The certification procedure shall be either within the COTS manual for the item or in the case of plumbing (ie air/electrical) separately identified in sufficient manner/detail and shall include, but not limited to, the requirement itself, frequency, duration, process, and regulation when applicable. Certification of this type may be required for compressors and/or storage bottles. Hazards that cannot be eliminated, cannot be controlled by equipment placement, and cannot be controlled by protective devices shall be identified to the user by printed placards which conform to ANSI Z535.4.

3.6.2. Component restraints. Doors, drawers, and other moving parts of the storage media shall be provided with restraints as necessary to secure them in the open and closed positions. Hardware shall also be installed in the GFM container to prevent storage cylinders from moving during transport. The cylinders shall have a minimum of two straps holding them in place with one strap above the Center of Gravity (CG) of the full cylinder and one strap below the CG of the full cylinder. Items stored in the FSRS shall be provided with restraints to secure them in place. The restraints shall prevent unintended movement of the moving parts and cylinders due to transport (see section 3.2).

3.6.3. Anti-entrapment measures. The GFM container is provided with an anti-entrapment measure to prevent personnel from being locked inside. Modifications to the container or the installation of FSRS components shall neither alter nor interfere with the operation of this feature.

3.6.4. Fire extinguisher bracket. The FSRS shall be equipped a single 10 lb ABC fire extinguisher bracket or two 5 lb ABC fire extinguisher brackets. The fire extinguisher bracket(s) shall not be designed to only hold a specific manufacturer's fire extinguisher. The contractor is not required to supply fire extinguishers with the FSRS. The bottles shall be designed to hold the bottle securely during transport.

3.6.5. First aid kit. The FSRS shall be equipped with a first aid kit that is easily accessible for treating minor injuries such as cuts and burns. The first aid kit shall contain medicines to prevent infection, eye drops, cotton swabs, stainless steel tweezers, and bandages.

3.6.6. Toxic materials. The FSRS shall be constructed of materials that, in their cured, dried, or other final processed state, do not present a health hazard to personnel during transportation, operation, or maintenance of the container. Exposure of the container to temperatures of 160F for extended periods shall not result in accumulation of toxic vapors inside the container which exceed the National Institute of Safety and Health (NIOSH) Threshold Limit Values for the substances present.

3.6.7. FSRS chemicals. The contractor shall not be responsible for supplying the chemicals that will be used in the FSRS, but a list of chemicals that will be present in the FSRS has been compiled to assist the contractor in any safety issues or material incompatibility issues the chemicals may impose. The contractor is responsible for ensuring that the equipment placed in the FSRS is compatible with the chemicals it may come in contact with during

regular operations as well as choosing, and properly labeling, an appropriate storage location for each chemical. The following chemicals are expected to be stored in the FSRS in the listed quantities: HFC-227/FE-227/FM-200 (250 lb 4bw400 tank), Halon 1301 (250 lb 4bw400 tank), sodium bicarbonate (50lb 5gallon bucket), distilled water (5 gallon bucket), mono-ammonium phosphate (50lb 5 gallon bucket), dry nitrogen (see section 3.12.6.1), petrotech 25 (50lb 5 gallon bucket), ansul plus fifty C powder (50lb 5 gallon bucket), black widow dry chemical (50lb 5 gallon bucket) and Purple K (50lb 5 gallon bucket). HFC-125 may also come in contact with the equipment because it is currently used as a fire suppression agent, but it will not be stored in bulk in the FSRS container because of its intolerance to high temperatures. Some of the chemicals listed are a trademark name specific to a company, so a functional equivalent may be used.

3.7. Economic life. The FSRS shall have a projected economic life of not less than fifteen years under the service conditions described herein.

3.8. Reliability/Maintainability. The FSRS shall not degrade the inherent reliability/maintainability characteristics of the GFM or its COTS components.

3.9. Ease of maintenance.

3.9.1. Access. To the maximum extent practical, it shall be possible for the majority of Army personnel to perform preventative maintenance on the FSRS container without removing or disassembling the fire refill equipment that is hard mounted to the container.

3.9.2. Fastening devices. Screws, pins, bolts, and similar parts shall be installed with means for preventing loss of tightness. The methods for preventing loss of tightness shall be according to accepted engineering standards and practices. No such parts subject to removal or adjustment shall be swaged, staked, or otherwise deformed.

3.10. Logistical support. Requirements pertaining to technical publications, supply support, and training aids shall be addressed in separately provided SOWs.

3.11. Warranty. All components shall be warranted as stated in section 3.12 paragraphs and tables. The warranty code indicates whether the item is to have a lifetime (L), a commercial manufacturer specified warranty (C), or no warranty required (N). The Federal Supply Classification (FSC) is provided to aid in the determination of applicability of Buy American and Berry Amendment laws. The offeror shall state the length and terms of the manufacturers' warranties in response to the solicitation. The warranties shall become part of the contract or delivery order.

3.12. FSRS Equipment and Tool Load. The equipment in the FSRS shall meet the following requirements. A possible configuration for the equipment in the container is shown in Figure 1, Figure 2, and Figure 3 in Appendix A. A variation of the configuration shown in Appendix A was built, tested, and fielded in limited quantities by the Government.

3.12.1. HFC-227 recharge station. The container shall be supplied with one HFC-227 recharge station for filling bottles with FE 25, HFC-227, Halon 1301, FM 200, and Novec 1230. The recharge station shall operate on compressed air requiring no more than 13 CFM at 130 psi. The recharge station shall facilitate filling empty bottles as well as recovering and recycling the chemicals in used bottles. The recharge station shall be capable of transferring nitrogen and HFC-227 in both liquid and vapor form. The recharge station shall be capable of transferring liquid HFC-227 at a minimum rate of 15 lbs per minutes and vapor HFC-227 at a minimum rate of 2 lbs per minute. The recharge station shall include a method of reading the amount of moisture of the agent being recovered. The recharge station shall filter the agent, removing particulate matter down to 5 microns, and have the ability to remove water to five parts per million. The entire system shall be rated for a minimum of 500 psi. The inlet pressure to the system shall be rated at no less than 1000 psi prior to the pressure reducing regulator and the nitrogen charger pressure relief valve shall be rated for a minimum of 850 psi. The recharge station shall be capable of remaining open or closed without the operator holding the valve manually. The recharge station shall be equipped with an additional whip that allows the operator to fill a fire extinguisher bottle with liquid nitrogen without using the HFC-227 recharge station filter. The recharge station shall be designed to be maintainable in the field or shop. The recharge station shall be supplied with a minimum of four adaptors that aid in the filling of the

vast majority of fire suppression FE 25, HFC-227, Halon 1301, FM 200, and Novec 1230 bottles. The recharge station shall come equipped with all of the hoses and fittings required to connect the system to the bulk storage cylinders outlined in section 3.12.5. The recharge station shall fit in an envelope no larger than 32" x 20" x 44" and shall weigh no more than 150 pounds. The recharge station shall be supplied with a commercial warranty. A possible source is Getz PN: 59296 (HFC-227 recharge station) with PN 59048 (Liquid nitrogen fill whip). FSC: 4210

3.12.1.1. HFC-227 maintenance kit. The HFC-227 recharge station shall be supplied with a maintenance kit. The maintenance kit shall be supplied with any special tools, equipment, and expendables to perform regular maintenance on the HFC-227 and its associated equipment under normal conditions. The maintenance kit shall have an additional 12 Halon replacement filters for use with the HFC-227 recharge station. The equipment shall be stored in a secure location or container. A possible source is Getz PN: 58941 (Maintenance kit) with PN 51250 (Halon replacement filters).

3.12.2. Recycled HFC-227 filter. The container shall be supplied with 12 filters that are specifically used for cleaning recycled HFC-227. The filter shall be capable of cleaning used Halon 1211 and Halon 1301 and delivering it back into a bulk storage tank similar to the ones outlined in section 3.12.5. The filter shall remove particulate matter down to 5 microns and have the ability to remove water to five parts per million. The canister and filter shall be rated for a pressure up to 500 psi. The filter shall be supplied with a canister and all of the plumbing and fittings required to connect it to the HFC-227 recharge station outlined in section 3.12.1. as well as the bulk storage cylinders outlined in section 3.12.5. The HFC filter shall not require a warranty. A possible source is Getz PN: 59605 (Filter canister) with PN 54192 (Recycled HFC-227 filters). FSC: 4330

3.12.3. Scale with bottle holder. The container shall be supplied with a bench mounted scale with a bottle holder mounted to the weighing surface of the scale. The bottle holder shall be capable of holding the bottles both horizontally and vertically. The bottle holder shall be adjustable to securely hold the majority of bottles that are filled by the HFC-227 recharge station (section 3.12.1.). The bench scale shall operate on 115V, 60Hz, 1 phase alternating current requiring no more than 1 amp. The weight display shall be digital and display numbers that are no less than 0.5" high. The readout must be positioned so that it is easily visible while filling bottles. The scale shall have the capacity to measure weights up to 100 lbs with accuracy of 0.05 or greater. The scale shall have the ability to be zeroed out when an empty bottle is placed on the scale. The scale shall be made of a material that is corrosion resistant and contain a moisture protected load cell. The scale shall fit in an envelope no larger than 11" x 11" x 5" and shall weigh no more than 35 pounds. The scale shall be supplied with a commercial warranty. A possible source is Getz, included in PN: 59296 (Section 3.12.3. HFC-227 recharge station) FSC: 6670

3.12.4. Work bench. The container shall be supplied with a minimum of one work bench. The work surface shall be between 31 and 38" high and shall have minimum working surface of 55" Wide by 23" deep. The work bench must be capable of supporting a minimum of 250 pounds evenly distributed across the working surface. The work bench must be located next to the HFC-227 recharge fill station (section 3.12.1.) and shall have the scale described in section 3.12.3. securely mounted to it. Additional work surfaces may be added near equipment that requires tools to help assist the operator. All work surfaces in the Government furnished container shall be corrosion resistant and shall not react with any of the chemicals listed in section 3.6.7. The work bench shall not require a warranty. A possible source is Getz PN: 59278. FSC: 7195

3.12.5. Bulk storage cylinder. The container shall be supplied with three empty bulk storage cylinders to store the chemicals used by the HFC-227 recharge station described in section 3.12.1. The bulk storage cylinder shall conform to DOT specification DOT-4BW400. The bulk storage cylinders shall hold a minimum of 250 pounds of clean or recycled agent. The bulk storage cylinder shall have a pressure relief valve as well as separate valves for extracting liquid and vapor. The bulk storage cylinders shall fit in an envelope no larger than 44" x 17" x 17" and shall weigh no more than 100 pounds empty. The bulk storage cylinders shall be supplied with a commercial warranty. A possible source is Getz PN: 52541. FSC: 6830

3.12.6. Nitrogen generator. The container shall be supplied with one nitrogen generator. The nitrogen generator shall operate on 115V, 60Hz, 1 phase alternating current requiring no more than 15 amps with a compressed air supply requiring no more than 12 CFM at 80 psi. The nitrogen generator shall be rated for 100% duty cycle and shall automatically turn on when the bottle/vessel drops below a desired pressure and automatically turn off when

the bottle/vessel reaches the desired pressure. The nitrogen generator shall be capable of producing 14 liters of nitrogen per minute with an outlet pressure of no less than 2400 psi. The nitrogen generator shall produce nitrogen that is 96% pure or greater and shall automatically shut down if the purity falls below 96%. The nitrogen generator shall have a means to alert the operator if the compressed air being provided to the nitrogen generator is contaminated or is no longer being properly filtered. The nitrogen bed shall perform for a minimum of 10,000 hours under normal conditions before an overhaul is required and the booster shall perform for a minimum of 4,500 hours under normal operating conditions before an overhaul is required. The nitrogen generator shall be supplied with all of the plumbing, fittings, and adaptors to connect the nitrogen generator to the nitrogen storage device outlined in section 3.12.6.1. as well as a standard K bottle. The nitrogen generator shall be capable of filling a standard K bottle utilizing a remote fill whip without disconnecting the nitrogen generator from the nitrogen storage device. The remote fill whip shall have a connector on the end that will allow the whip to fill the majority of K bottles and shall be no less than 6 feet long. The nitrogen generator shall fit in an envelope no larger than 24" x 11" x 40" and shall weigh no more than 350 pounds. The nitrogen generator shall be supplied with a commercial warranty. A possible source is Mandus Group PN: MG1100V (Nitrogen Generator without integrated nitrogen storage) with Getz PN: 59667 (Remote K bottle filling whip). FSC: 3655

3.12.6.1. Nitrogen storage. The container shall be supplied with a means to store the nitrogen that is generated by the nitrogen generator. The nitrogen storage device shall hold a minimum of 425 cubic feet of nitrogen at 2000 psi. The nitrogen storage media shall fit in an envelope no larger than 25" x 12" x 56" and shall weigh no more than 350 pounds when empty. The nitrogen storage media shall not require a warranty. A possible source is S.J. Smith PN: PUR244.

3.12.7. Nitrogen regulator. The container shall be supplied with a minimum of two nitrogen regulators. One nitrogen regulator shall regulate the pressure from the liquid fill hose from the HFC-227 (section 3.12.1) and the other nitrogen regulator shall regulate the pressure delivered to the area by the down draft table (section 3.12.8.). The pressure regulator near the HFC-227 station shall have an inlet pressure rating from 0 to 3000 psi and an outlet pressure of 0-1500 psi. The pressure regulator near the down draft table shall have an inlet pressure rating from 0 to 3000 psi and an outlet pressure of 0 to 600 psi. Both pressure regulators shall be adjustable, and include an indicator that shows the pressure of the inlet and outlet. The nitrogen regulators shall be supplied with commercial warranties. A possible source is Getz, included in PN 59296 (Section 3.12.3. HFC-227 recharge station) and PN 59668 (Section 3.12.10. Down draft table). FSC: 1285

3.12.8. Down draft table. The container shall be supplied with one down draft table to reduce the amount of air particulates introduced to the operator during dry chemical operations. The down draft table shall operate on 115V, 60Hz, 1 phase alternating current requiring no more than 8 amps. The down draft table shall be capable of producing a minimum flow rate of 1000 cubic feet per minute and shall be equipped with a means to determine when the system is losing suction. The down draft table shall be designed to resist corrosion using powder coating and/or a corrosion resistant material. The direction of the fan exhaust shall be expelled in such a fashion that it does not negatively impact the ability of the operator to perform their mission with the equipment. The down draft table shall be capable of filtering the intake down to 5 microns using standard filters or filters that can be easily cleaned in the field. The down draft table shall have a minimum working surface of 35" x 25" with a means to secure the scale in section 3.12.9. during operation. The work surface shall be capable of supporting 250 pounds evenly distributed. The down draft table shall be supplied with an air gun and the necessary plumbing to connect the air gun to the FSRS's nitrogen supply. The down draft table shall have access to a regulated nitrogen source with plumbing that is long enough to reach the down draft tables work surface. The down draft table shall fit in an envelope no larger than 37" x 28" x 51" and shall weigh no more than 220 pounds. The down draft table shall be supplied with a commercial warranty. A possible source is Getz PN: 59668. FSC: 3694

3.12.9. Bench scale. The container shall be supplied with one scale to weigh dry chemicals on the down draft table. The bench scale shall operate on 115V, 60Hz, 1 phase alternating current requiring no more than 1 amp. The weight display shall be digital and display numbers that are no less than 0.5" high. The readout must be positioned so that it is easily visible while filling bottles. The scale shall have the capacity to measure weights up to 125 pounds within 0.05 pounds and have the ability to be zeroed out when an item is placed on the scale. The scale shall be made of a material that is corrosion and dust resistant and contain a moisture protected load cell. The scale shall fit in an envelope no larger than 14" x 11" x 5" and shall weigh no more than 25 pounds. The bench scale shall be supplied with a commercial warranty. A possible source is Getz, included in PN 59668 (Section 3.12.10. "Down

draft table"). FSC: 6670

3.12.10. Dry chemical fill system. The container shall be supplied with a dry chemical fill system that dispenses dry chemicals. The fill system shall operate on compressed air, requiring no more than 3 CFM at 80 psi. Each chemical being dispensed shall have its own line to prevent cross contamination, and each line shall be capable of reaching the down draft table (section 3.12.8.). Each line shall have a valve to adjust the rate at which the dry chemical is dispensed. The dry chemical fill system shall be supplied with all of the plumbing and fittings that are required to connect the fill system to the dry storage device described in section 3.12.10.1. The dry chemical fill system, without hoses, shall fit in an envelope no larger than 16" x 16" x 8" and shall weigh no more than 30 pounds. The fill system shall be supplied with a commercial warranty. A possible source is Getz PN: 58610. FSC: 4310

3.12.10.1. Dry chemical storage. The FSRS shall be supplied with a storage device that can safely store a minimum of 3 separate fire suppression dry chemicals and will work in conjunction with the dry chemical fill system. The chemicals shall be fully contained separately from one another to prevent cross contamination when the hoppers are sealed. Each hopper shall have a minimum volumetric capacity of 1.50 cubic feet with a minimum weight capacity of 125 pounds. Each hopper shall have its own line to dispense the chemical as well as separate shut off valves for each hopper. The dry chemical storage system, without hoses, shall fit in an envelope no larger than 46" x 18" x 39" and shall weigh no more than 150 pounds when empty. The dry chemical storage device shall be supplied with a commercial warranty. A possible source is Getz, included in PN: 58610 (Section 3.12.10. "Dry chemical fill system"). FSC: 4210

3.12.11. Fire bottle storage rack. The container shall be supplied with a storage rack to allow recently filled fire suppression bottles to stay in the container for a period of 24 hours. The storage rack shall provide separate spaces for a minimum of 21 fire suppression cylinders. The storage rack shall employ provisions that prevent the bottles from being scratched or damaged while being placed in, or being removed from, storage. Each bottle holder shall have a minimum opening of 8" x 8" and shall be a minimum depth of 24". The storage rack system as a whole shall fit in an envelope no larger than 25" x 25" x 56" and shall weigh no more than 100 pounds. The storage rack shall be supplied with a commercial warranty. A possible source is Zico PN: PACSR-B. FSC: 4210

3.12.12. Pneumatic belt vise. The container shall be supplied with one pneumatic belt vise to hold fire suppression cylinders when removing the heads. The pneumatic belt vise shall be positioned in such a way that allows the operator to put a three foot breaker bar on the head of a cylinder in the vise. The system shall operate on compressed air, and require a pressure no greater than 100 psi for operation. The belt vise may also operate using compressed nitrogen if the system expels only a minimal amount of nitrogen. The belt vise must be mounted to the floor securely using no less than six ½" size bolts. The belt vise shall utilize a flexible belt that securely holds the cylinder without scratching or damaging the cylinder. The belt vise shall be capable of holding cylinders ranging from approximately 3 to 12 inches in diameter. It is acceptable to use an adaptor pad, or some other device, to allow the bottle vise to hold bottles within this diameter range. The belt vise shall fit in an envelope no larger than 18" x 39" x 21" and shall weigh no more than 125 pounds. The belt vise shall be supplied with a commercial warranty. A possible source is Getz PN 58634 (Pneumatic belt vise) with Getz PN 58510 (Belt vise adaptor pad). FSC: 5130

3.12.13. Air compressor. The container shall be supplied with one air compressor. The air compressor shall operate on 208V, 60Hz, 3 phase alternating current and shall draw no more than 5.3 kW during normal running operations. The air compressor shall have enough pressure relief valves to ensure safe operation during the entire compression cycle. The air compressor shall be capable of producing a minimum flow rate of 16 CFM and produce an outlet pressure of 150 psi or greater. The air compressor shall be supplied with an air receiver that holds a minimum of 25 gallons. The air compressor shall be rated for 100% duty cycle and shall automatically turn on when the air receiver drops below a desired pressure and automatically turn off when the air receiver reaches the desired pressure. The system shall be equipped with a means to drain condensate. The air compressor shall include a means to filter the air being drawn into the air compressor as well as a means to filter the water out of the air leaving the compressor. The air compressor shall be supplied with the hoses, adaptors, and fittings to plumb the compressed air to the equipment that requires it. The air compressor shall fit in an envelope no larger than 46" x 28" x 45" and shall weigh no more than 450 pounds. The air compressor shall be supplied with a commercial warranty. A possible source is Mi-T-M PN: AS2-PE05-30M (portable) or AS2-PE05-30M with option AX-0027 (stationary). Replace the current oiler on these PNs with Mi-T-M PN: AT-4011-M. FSC: 4310

3.12.13.1. Electrical interfaces. The ECU may be required to run at full capacity for the entire time the trailer is deployed because of the required interior conditions outlined in section 3.5.4. The system is required to operate on no more than 10Kw of power, so the contractor may be required to install a soft starter to reduce the initial amperage draw of the air compressor without causing an uncontrolled loss of power to the system. These electrical interfaces must be compatible with the air compressor. A possible source is Siemens PN: 3RW3026-1BB14.

3.12.13.2. Portable Compressor. It has been deemed acceptable to move the air compressor outside of the container when the system is deployed. Moving the air compressor outside the container makes the compressor subject to the requirements outlined in section 3.2.1.2. A mobile compressor is more susceptible to conditions outside, so the compressor may run slightly below 100% duty cycle in inclement weather conditions. However, because the compressor is more susceptible to outside conditions, a means to protect the compressor while it is outside during inclement weather must be supplied. If the compressor is expected to be removed from the container during operation, the compressor must be commercially marketed as a portable compressor. The compressor must have a minimum of two wheels, a minimum of one handle that two people can access together, and the compressor must be equipped with a rugged frame that can support the compressor during movement. If the compressor is considered mobile, the contractor must demonstrate that there is adequate room in the Government furnished ISO container for the unit during transport and the compressor must be supplied with the proper hardware to secure it during transport as outlined in sections 3.2.1.1.1. through 3.2.1.1.5.

3.12.13.3. Hard mounted compressor. The GFM container has a mechanical room that measures approximately 80" long by 35" wide by 39" high. The Government has deemed it acceptable to hard mount a compressor in the mechanical room for operation. The mechanical room is equipped with a sliding mechanism that would allow the compressor to be pulled out of the mechanical room during operation and stowed during inclement weather. If it is determined that a hard mounted compressor will be used, the compressor shall be plumbed with enough flexible hose to allow the compressor to be pulled from the mechanical room on the sliding mechanism for routine maintenance and operation. The mechanical room is sealed from the main working compartment, so a means to provide compressed air to the main working compartment and power to the compressor must be devised that meets the requirements in section 3.2.1.2.

3.12.14. Air regulator. The container shall be supplied with a minimum of two air regulators to regulate the compressed air supplied to the HFC-227, Nitrogen Generator, dry chemical fill system, and the pneumatic belt vise (section 3.12.1., 3.12.6., 3.12.10., and 3.12.12.) The regulators shall be rated for an inlet pressure of no less than 400 psi and shall be capable of producing an outlet pressure of 125 psi or less. The pressure regulator shall be adjustable with an indicator to show the pressure of the outlet. The air regulators shall be provided with a commercial warranty. A possible source is Getz PN: 58599. FSC: 1660

3.12.15. Dry chemical funnel attachment. The container shall be supplied with a funnel attachment that fits onto dry chemical buckets to assist in the controlled pouring of dry chemicals. The funnel attachment shall be capable of quickly attaching to the majority of 50 pound dry chemical pails with an opening of approximately 9.5". The funnel shall have a minimum of two stainless steel mesh screens to prevent particles that are approximately 0.25" and larger from passing through the funnel, and an exit spout that is approximately 0.75" in diameter. The funnel must be designed to resist corrosion using powder coating and/or a corrosion resistant material. The funnel must be compatible with all of the chemicals listed in section 3.6.7. The dry chemical funnel attachment shall fit in an envelope no larger than 24" x 10" x 10" and shall weigh no more than 15 pounds. The funnel attachment shall be supplied with a commercial warranty. A possible source is Getz PN: 59568. FSC: 4210

3.12.16. Cylinder moving hand cart. The container shall be supplied with a hand cart to assist the operator in moving cylinders. The hand cart shall have a minimum of two solid rubber tires with a minimum diameter of 9" and a minimum width of 2.5". The hand cart shall be designed specifically for holding cylinders, with a rounded back rest to cradle the cylinders while in transit. The hand cart shall have a handle that is large enough to be accessed by two people at the same time. The cart shall have a minimum capacity of 500 pounds. The hand cart shall be designed to resist corrosion using powder coating and/or a corrosion resistant material. The cylinder moving hand cart shall fit in an envelope no larger than 22" x 49" x 18" and shall weigh no more than 40 pounds. The cylinder moving hand cart shall be provided with a commercial warranty. A possible source is S.J. Smith PN: WES 656Z2. FSC: 3920

3.12.17. CO₂ Pump. The container shall be supplied with one CO₂ pump for filling liquid CO₂ bottles. The CO₂ pump shall operate on compressed air requiring no more than 16 CFM of air at 130 psi. The pump outlet shall be adjustable with a maximum fill rate of no less than 10 pounds per minute. The pump shall be designed with fitting and parts that are resistant to corrosion including stainless steel piston sleeve(s), check valves, springs, and retainers. The inlet shall be rated for a pressure of 1400 psi or greater and shall have a safety relief valve. The pump shall not require oil and shall be considered easily maintainable in the field/shop. The pump shall be supplied with a minimum of four CO₂ adaptors that aid in the filling of a large majority of CO₂ fire suppression bottles. The CO₂ pump shall be supplied with all of the hoses and connectors to allow the CO₂ pump to fill from a 75 pound or 100 pound high pressure supply cylinder. The CO₂ pump shall be supplied with any tools that will be required for maintenance as well as the appropriate expendables that will be required for maintenance on the CO₂ pump and its associated equipment. The CO₂ pump shall fit, without hoses, in an envelope no larger than 15" x 14" x 11" with a weight of no more than 45 pounds. The CO₂ pump shall be supplied with a commercial warranty. A possible source is Getz PN: 58593. FSC: 3655

3.12.18. CO₂ cylinders. The container shall be supplied with two empty 1R CO₂ cylinders for use with the CO₂ pump in section 3.12.17. The CO₂ tanks shall be supplied empty and ready to be filled and utilized with the proper fittings required to connect to the CO₂ pump (section 3.12.17.). The CO₂ tanks shall comply with UN 1956DOT for compressed gases. The CO₂ tanks shall have a regular filling pressure no less than 200 psi at 70° F. Each CO₂ tank shall fit in an envelope no larger than 68" x 11" x 11" with an empty weight of no more than 75 lbs. The CO₂ cylinders do not require a warranty. A possible source is S.J. Smith PN: MG1665. FSC: 8120

3.12.19. Fire refill Personal Protection Equipment. The container shall be supplied with the following pieces of equipment to help protect the operator.

Table 1. Fire Refill Personal Protection Equipment (PPE)

Line Item	Item Description	UI	QTY	FSC	Possible Source of Supply	Warranty
1	Air Filter Respirator	EA	20	4240	3M #8515 N95 Respirators	C
2	Industrial Goggles: Ventilated and conforms to ANSI Z87.1. Adjustable to fit the majority of users.	EA	4	4240	Bouton 4510817	C
2	Eye Wash Station: Hold a minimum of 5 gallons of pressurized clean water. No water supply plumbing required. Constructed of corrosion resistant materials and equipped with a safety relief valve for over pressurization. Equipped with clear markings to indicate use.	EA	1	4230	Encon Safety Products 01103001	C
3	Neoprene Gloves: Minimum of 0.010" thick with a five finger design. Equipped with a feature that increases traction between the users palm and/or fingers and the item they are holding. Sized to fit the majority of operators.	Pair	4	4220	Lab Safety Supply 35509	C
4	Face Shield Head Band: Meet or exceed ANSI Z87.1 (Combined with Face Shield). Sized to fit the majority of operators.	EA	2	4240	Jackson Safety 3000001 Model K	C
5	Clear Face Shield: Minimum of 14" by 8" and .06" thick. Meet or exceed ANSI Z87.1.	EA	4	4240	Jackson Safety 3002830	C

3.12.20. Fire bottle maintenance tools. The container shall be supplied with the following equipment to help facilitate in the maintenance and inspection of fire bottles. The equipment and accessories outlined in Table 2 must be stored in a mobile durable case.

Table 2. Fire Bottle Maintenance Tools

Line Item	Item Description	UI	QTY	FSC	Possible Source of Supply	Warranty
1	Fire extinguisher service set:	ST	1		Getz 59620	
1.1	Inspection Light: Minimum of 15" long, flexible, and water resistant.	EA	N/A	6120		C
1.2	Rubber Mallet: Wood handle, minimum handle length of 12", and head weight between 10 and 15 ounces.	EA	N/A	5120		N
1.3	Extinguisher Valve Cleaning Kit: (1) nylon brush, (1) brass brush, (1) steel brush.	EA	N/A	7920		N
1.4	Extinguisher Clamp: Nickel-plated steel with padded grips and tips.	EA	N/A	5340		N
1.5	Tube of O-Ring Lube: Silica thickened, high molecular weight dimethyl silicone compound with excellent dielectric properties.	EA	N/A	9150		N
1.6	Dry Chemical Adapters: Minimum of 12 quick coupling adapters to fit the majority of dry chemical bottles. The adaptors must be compatible with the nitrogen delivery system attached to the down draft table in section 3.12.8.	EA	N/A	4220		C
1.7	Hole Punch for Tags: 2" minimum reach. Punches an approximately 5/16" diameter hole.	EA	N/A	3610		N
1.8	Set of O-Ring Picks: Picks specifically designed for removing O-rings.	EA	N/A	5120		N
1.9	5 Gallon Plastic Bucket: Minimum capacity of 50 pounds with seal tight lid.	EA	N/A	7240		N
1.10	Pack of Annual Fire Extinguisher Tags – Pack of 1000: Imprinted extinguisher service tags printed on both sides with black ink on a coated 13pt stock with reinforced eyelets.	EA	N/A	9310		N
1.11	Pack of Tamper Seals – Pack of 1000: Medium flag tamper seal that is a U.L. recognized component for fire extinguishers. Each tag shall be dated with current year to show it has been replaced during an annual maintenance, according to NFPA 10.	EA	N/A	4240		N
1.12	Needle Nose Pliers: Approximately 5-1/2" long.	EA	N/A	5120		N
1.13	Fire Extinguisher Service Tags – Pack of 100: Designed to document the work performed on each extinguisher. Equipped with a looped string to attach to gauge.	EA	N/A	9310		N
1.14	Fire Extinguisher Verification Collars – Pack of 100: Must comply with 2007 edition of NFPA 10 and made of durable polymer material.	EA	N/A	9330		N
1.15	7/16" Combination Wrench: 6pt combination.	EA	N/A	5120		N
2	Digital thermometer: Shall have an audible and visible alarm that alerts the operator when the temperature goes above or below an operator programmed temperature range. Shall be wall mountable with an accuracy of $\pm 2^{\circ}\text{F}$. Shall use standard batteries.	EA	1	6685	Getz PN: 59671	C
3	5 Gallon Plastic Bucket: Minimum capacity of 50 pounds with seal tight lid.	EA	3	7240	Getz PN: 54217 (Bucket) and 54264 (Lid)	N

4	2-5/16" Crowfoot Wrench: Shall have a 2-5/16" opening. Shall have a 3/8" drive female opening. Shall have a chrome finish.	EA	1	5120	IDSC Holdings/Snap-on PN: FC74A	L
5	3" Crowfoot Wrench: Shall have a 3" opening. Shall have a 3/8" drive female opening. Shall have a chrome finish.	EA	1	5120	IDSC Holdings/Snap-on PN: FC96A	L
6	Reset VR Tool	EA	1	5120	Amerex PN: MISC2	N
7	3/8" Breaker Bar: Shall have a 3/8" male square drive. Shall have an overall of length of 12" +/- 1". Shall have a chrome finish. Shall be in accordance with ASME/ANSI B107.10.	EA	1	51**	IDSC Holdings/Snap-on PN: F12LA	L

4. Quality Assurance Provisions

4.1. General provisions. The inspections (demonstration and/or examination) herein shall be performed to determine whether the FSRS system conforms to Section 3 of this DFP. Unless otherwise specified in the contract, or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1. Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2)
- b. Conformance inspection (see 4.3)
- c. Inspection of packaging (see 4.17)

4.1.2. Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the inspection conditions specified herein.

4.1.3. Inspection methods. When validation states per specific paragraph 3 requirements, the validation technique utilized shall be a visual inspection of the component and its literature (if applicable). Measuring devices shall be utilized as required to verify dimensions.

4.2. First article inspection.

4.2.1. Submission. The contractor shall submit one or more FSRS for verification as designated by the Contracting Officer (or as specified here) for evaluation in accordance with the specified requirements. (See section 3)

4.2.2. Inspections to be performed. As determined by the Government, the product verification assemblies, components and test specimens may be subjected to any or all of the verifications and inspections specified in sections 4.4 through 4.16.

4.2.3. Rejection. If any test assemblies, test specimens or test components fail to comply with any of the applicable requirements, the preproduction verification sample shall be rejected. The Government reserves the right to terminate inspection upon any failure of a test assembly, specimen or component to comply with any of the requirements.

4.3. Conformance inspections.

4.3.1. Conformance. Conformance inspection shall be applied to production units being offered for acceptance under the contract. These inspections shall include all verifications listed in sections 4.5 and be limited to the examination of product to verify compliance with requirements established during preproduction verification.

4.3.2. Inspection lot formation. Lot formation shall be in accordance with Section 4 of MIL-STD-1916.

4.3.3. Sampling plan determination. When required by contract or cited herein, attribute-sampling inspections shall be conducted in accordance with MIL-STD-1916 using Verification Level (VL) I.

4.3.4. Rejection. Failure of any unit to pass any verification shall be cause for rejection of the lot.

4.4. Product performance verification.

4.4.1. Industrial/professional quality tools. Verify that the tools listed in section 3.12. are considered industrial or professional grade as described in section 3.1.5.

4.4.2. Dimensional requirements. Verify the work aisle has not been reduced to less than 25 inches at any point. (Section 3.1.6.)

4.4.3. Government Furnished Materials (GFM). Verify by examination the Government furnished 8' x 8' x 20' ISO container was used to house the FSRS equipment. Verify that no major changes were made to the container that might require extensive retesting of the container itself. Verify the contractor has used the Government furnished ECU. Verify the ECU location and features have not been changed and no major changes were made to the units that might require retesting. (Section 3.1.7.)

4.5. Deployment and transportability.

4.5.1. Transport/Storage. Provide an analysis showing that the FSRS in its transport mode is suitable for commercial shipping via air, sea, or highway. (Section 3.2.1.1.)

4.5.2. Shock and Vibration. Provide an analysis showing that the FSRS can withstand the shocks and vibrations associated with commercial shipment as secured cargo without sustaining damage or degradation in performance. The analysis shall also show that during shipping the systems components, accessories, parts, or tools shall not be damaged or displaced. (Section 3.2.1.1.1.)

4.5.3. Rail transport. The SATS and a fire suppression refill variant of the SATS called the SATS Field Maintenance Module 3 (FMM3) have successfully passed ground mobility testing. Given these two have been tested, and the FSRS incorporates many of the same items as the SATS FMM3, the rail impact testing of the FSRS will be determined based on the commonality between the components, layout, and installation of equipment in the FSRS and the SATS FMM3. If there is enough commonality the Government may waive the requirement for the FSRS to undergo rail impact testing. If it is determined that there are too many differences between the FSRS and the SATS FMM3 to waive testing, the trailer-mounted FSRS shall be tested in accordance with MIL-STD-810, Method 516.5, Procedure VII - Rail Impact. The FSRS shall be in transport configuration for the test, with all items in their storage locations and all doors and drawers closed and locked. Binding of any door or drawer; dislodgment of or damage to any stored item; or damage to any part of the container shall be cause for rejection. (Section 3.2.1.1.2)

4.5.4. Air transport. Verify that any modifications to the GFM container neither alters nor interferes with the operation of the vent that prevents damage due to emergency decompression of the aircraft, and the vent is not blocked. Verify the center of balance of the loaded FSRS is marked and in accordance with MIL-STD-129P and ASTM-D5445. (Section 3.2.1.1.3)

4.5.5. Military ground transport. Verify the fully loaded trailer-mounted FSRS is suitable for transport by an Army M1083 tactical cargo truck as a towed package. (Section 3.2.1.1.4.)

4.5.6. Ground mobility. The SATS and the SATS Field Maintenance Module 3 (FMM3) have successfully passed ground mobility testing. Given these two have been tested, and the FSRS incorporates many of the same items as the SATS FMM3, the testing of the FSRS will be determined based on the commonality between the components, layout, and installation of equipment in the FSRS and the SATS FMM3. If there is enough commonality, the Government may waive the requirement for the FSRS to undergo ground mobility testing. If it is

determined that there are too many differences between the FSRS and the SATS FMM3 to waive testing, ground mobility testing will include: not more than 75 miles on a Secondary Road of native soil composition, 50 miles on a moderately rough Cross Country course of native loam with quarry spall composition, and 25 miles on a Belgian Block course. In addition, 5 laps around a segmented Road Shock and Vibration Course consisting of 2-inch Washboard, 2 to 4 inch Radial Washboard, 3-inch Spaced Bump and a 6-inch Washboard shall be required. Maximum safe speed for the surface and conditions shall be maintained; not to exceed 35 mph on secondary roads, 15 mph for travel cross-country, and 15 mph for Belgian Block course. Speeds for the Road Shock and Vibration course shall vary between 2-10 mph. Any evidence of damage to the container, including loose or missing fasteners, any damage to, or displacement of, any component, accessory, part, or tool installed in or on the FSRS, or the failure of any item of equipment in the FSRS to function properly upon completion of the test shall be cause for rejection. (Section 3.2.1.1.5)

4.5.6.1.1. Weight. Weigh the FSRS to verify the gross weight of the fully loaded FSRS system, with the SATS kitchen trailer, doesn't exceed the 21,000 pound maximum towing capacity of the Army M1083 or the 15,000 pound maximum gross weight of the GFM container. (Section 3.2.1.1.6.)

4.5.6.1.2. Balance. Verify the CG of the fuller load FSRS is within 6 inches of the longitudinal centerline of the shop container, and when the fully loaded FSRS is trailer mounted the lunette/pintle load is not less than 1,050 lbs and not more than 2,100 lbs. Verify the CG of the loaded FSRS trailer-mounted container in transport mode is at a height producing a trailer Static Stability Factor of at least 0.75. (Section 3.2.1.1.7.)

4.5.6.2. Deployed. If the compressor is expected to be removed from the container when deployed, verify the compressor is capable of receiving power from the container as well as providing compressed air to the inside of the container while the container is sealed. Verify the contractor has utilized the compressed air and power access location as identified by the Government's models (see Figure 4 Appendix A). (Section 3.2.1.2.)

4.6. Inputs and interfaces.

4.6.1. Human interface. Verify the container complies with the guidelines of Appendix D of the SATS DFP 420. (Section 3.3.1)

4.6.2. Protective clothing. Verify the container can be set up for operation by troops wearing heavy gloves and winter gear, where applicable. (Section 3.3.2.)

4.6.3. Electrical container interface. Verify that any modifications to the container's lighting system satisfy section 3.3.2.2 in the SATS DFP 420. Verify that that ECU is capable of running at full capacity as well as equipment that must run together without causing an uncontrolled loss of power or voltage. Verify that all components and regulating devices outlined in section 3.12. are compatible with the electrical sources that provide them power. (Section 3.3.3.)

4.6.4. Plumbing interface. Verify the container is supplied with a fully integrated plumbing system that connects the appropriate pieces of equipment to one another. Verify that the plumbing between components is designed so that they can be removed/replaced between components without disassembly/removal of the component(s) themselves. Verify all components and regulating devices outlined in section 3.12. are compatible with each other and the gas sources that feed them. Verify the plumbing is appropriately sized to allow each piece of equipment to run at maximum capacity. (Section 3.3.4.)

4.6.5. Size. Verify that when the FSRS container is ready for transport the overall width of the system does not exceed 96 inches, and no part mounted to the container extends beyond the planes defined by the outer surfaces of the container corner blocks. (Section 3.3.5.)

4.6.6. Task loading. Demonstrate that the FSRS can be readily set up for operation by two persons in 1.5 hours or less. When finished, demonstrate that the same operators can return all equipment to its storage location, and prepare the shop for transport within the same timeframe. (Section 3.3.6.)

4.6.7. Security. Verify that all openings of the container are lockable by use of padlocks which conform to Type I of Commercial Item Description A-A-59486A. (Section 3.3.7.)

4.6.8. Plates and labels. Examine all plates and labels affixed to the FSRS. Affirm that the US English language is used. Examine all plate and label material specification sheets, including marking, engraving techniques. Verify that they are resistant to all environmental elements and petroleum products and will remain legible for the life of the system. Verify that the plates and labels do not adversely affect the life and utility of the FSRS container or equipment. (Section 3.3.8.)

4.6.8.1. Item identification. Verify that the FSRS identification plate is plainly visible on the exterior of the container, and that it contains the information and material requirements of section 3.3.8.1.

4.6.8.2. Shipping Data. Verify the FSRS shipping data plate is plainly visible on the exterior of the container in transport mode, and that it contains the information and material requirements of section 3.3.8.2.

4.6.8.3. Hazard identification. In deployed mode, examine the FSRS unit for all unguarded physical hazards (see section 3.6.1) and verify that they are all properly identified and labeled in accordance with ANSI Z535.4. Verify the chemical storage labels are accompanied with warnings that caution the operator from mixing the labeled chemical with other chemicals that may cause a hazardous condition. Verify that a sign is posted near the HFC-227 recharge station that cautions the operator from storing HFC-125 in the container if temperature are expected to reach 120F or greater. Verify all signs and labels conform to ANSI Z535.4. (Section 3.3.8.3.)

4.6.8.4. Noise hazards. Measure the noise generated by noise generating components of the FSRS unit while being operated in a free field using the A scale at slow response on a sound level meter meeting the Type I requirements of ASA S1.4. Establish a steady state 85 dB (A) contour surrounding the component by measuring at least 8 locations, at a height of 5 feet above the ground plane at angular increments of not more than 45 degrees from the noise source. The maximum distance at which 85 dB (A) is obtained shall be indicated on a noise hazard caution sign posted on the component. (Section 3.3.8.4.)

4.6.8.5. Lift hazards. Verify that caution signs are placed on all stored items exceeding the “Design Weight Limits” of Appendix D in the SATS DFP 420. (Section 3.3.8.5.)

4.6.8.6. Warranty information. Verify that the warranty label is plainly visible on or near the personnel door of the FSRS container, and that it contains the information requirements of section 3.3.8.6.

4.6.8.7. Unique Item Identification (UID). Verify that UIDs are plainly visible on the exterior of the FSRS container and any COTS items worth over \$5,000. Verify that the UIDs conform to the requirements of the contract, MIL-STD-130, and other requirements of section 3.3.8.7.

4.7. General Storage.

4.7.1. Easy access. Using operators that meet the anthropometrical requirements of Appendix D of the SATS DFP 420, demonstrate that all equipment and supplies stored within the FSRS are accessible while standing in the container (stooping and bending are permitted). Verify the floor to ceiling/overhead obstruction height inside the container is at least 76 inches. (Section 3.4.1.)

4.7.2. Organized storage. Verify each item in the FSRS has a designated storage location. Verify special precautions have been taken to ensure that the locations where chemicals are expected to be stored in the container are labeled prominently and that reactive chemicals have been stored in such a way as to prevent them from coming in contact with one another during regular duty. (Section 3.4.2.)

4.7.3. Visual cues. Verify that each item location has a visible cue when the item is not in storage. (Section 3.4.3.)

4.7.4. Rapid inventory. With all items in their storage locations, measure the time required to have one operator inventory the FSRS unit for all its tools, machinery, and related supplies being present and secured in their proper location. The measured time shall not be greater than two hours for the full equipment load. Any missing item shall be identifiable by name and/or NSN, CAGE code, and part number within three minutes. (Section 3.4.4.)

4.7.5. Multipurpose storage. Verify that general storage has been made available near the HFC-227 recharge area and the dry chemical fill area for expendable items like o-rings and job specific items like adaptors to fit the different fire suppression bottles. Verify the storage media protects the items during transport and also makes them easily accessible during operation. Verify the general storage media has extra compartments for additional adaptors and o-rings that may be required when the system is fielded. (Section 3.4.5.)

4.7.6. Linear Products. Verify flexible linear products more than ten feet long are stored on reels or looms when possible. Verify reusable straps, ties, or other devices are provided for linear products not stored on reels or looms to permit them to be stored and hand-carried in neat coils. Verify hoses or other flexible linear products that have one end permanently affixed to the equipment and the other end used for operation have a strap, tie, or other device to secure them when they are not in use. (Section 3.4.6.)

4.7.7. Proximate storage. Verify that items used together are stored in the same area. (Section 3.4.7.)

4.8. Environment.

4.8.1. Environmental Requirements. Verify the FSRS is operable in temperatures ranging from -25F to 120F in tropical, desert, temperate, and sub arctic climate conditions. Verify the system is capable of withstanding storage conditions ranging from -50F to 160F in the same climate conditions. (Section 3.5.1.)

4.8.2. Corrosion protection. Verify the metal that is added to the container is painted or coated to match the container. Verify the paint or coating is capable of protecting the material from corrosion over the life of the system. (Section 3.5.2.)

4.8.3. Weather protection. Verify that modifications to the container have not degraded its ability to protect its contents from weather. If the Government has reason to believe that the weather tightness of the GFM container has been compromised, the FSRS shall be tested in accordance with MIL-STD-810, Method 506, Procedure II with a nozzle pressure of 40 psig (276 kPa) and a duration of at least 40 minutes. During the test, all items shall be in their storage locations and all doors and panels shall be closed and locked. Immediately following the test all doors and panels will be opened and examined for any evidence of water. Water in any cavity of the container shall be cause for rejection. (Section 3.5.3)

4.8.4. Interior environment. Verify that modifications to the container have not degraded the ECU's ability to maintain a constant temperature of 70F inside the GFM container. If it is believed the integrity of the GFM container has been compromised, the Government may deem it necessary to provide an analysis showing that the container can maintain a constant interior temperature of 70F while undergoing the conditions described in section 3.5.4.

4.8.5. Fungus, mildew, mold, and moisture. Examine the material specifications of all the materials used in the FSRS and verify that all hoses, cable covers, and other elastomer parts are fungi, mildew, mold, and moisture resistant. (Section 3.5.5.)

4.8.6. Ozone. Examine the material specifications of all the materials used in the FSRS and verify that all hoses, cable covers, and other elastomer parts exposed to the atmosphere are ozone resistant. (Section 3.5.6.)

4.8.7. Survivability. The FSRS must be survivable in the battlefield environment.

4.8.7.1. Protective coloration. Confirm that all metal parts added to the Government furnished FSRS system exterior have a protective finish in accordance with MIL-STD-171, finish 7.3.1 plus 20.24 (CARC) for aluminum and finish 5.1.1 plus 20.24 for ferrous metals and is compatible with the camouflage pattern (if approved). (Section 3.5.7.1.)

4.8.7.2. Blackout conditions. Verify that while in its operational configuration with the personnel entryway(s) closed, the container is light tight. Verify that the blackout conditions lighting system furnished by the Government has not been altered and is in full working conditions. (Section 3.5.7.2.)

4.8.7.3. Nuclear, Biological, and Chemical Contamination Survivability. If the Government believes the NBC survivability of the GFM container has been degraded, an analysis of the container's NBC survivability shall be supplied. (Section 3.5.7.3.)

4.9. Safety.

4.9.1. Physical hazard control. Examine the FSRS unit and confirm all moving parts, electrically energized parts, and high temperature surfaces are provided with guards, covers, or insulation to protect personnel from inadvertent contact. Verify that components and or plumbing that require periodic recertification or replacement are clearly identified. Also, confirm that safety guards, covers, and insulation do not interfere with the operation of the FSRS. Verify that any physical hazard that cannot use protective devices are identified, by type, with a plainly visible warning sign. Verify that components and or plumbing that require periodic recertification or replacement are clearly identified. (Section 3.6.1.)

4.9.2. Component restraints. Verify that all doors, drawers, cylinder, and moving parts of the storage system are provided with restraints. (Section 3.6.2.)

4.9.3. Anti-entrapment measures. Verify that the anti-entrapment measures of the GFM container have not been rendered inaccessible or inoperable. (Section 3.6.3.)

4.9.4. Fire extinguisher bracket. Verify the FSRS is equipped with a bracket capable of holding a single 10 pound ABC fire extinguisher or 2 brackets designed to hold 5 pound ABC fire extinguishers. Verify the fire extinguisher bracket(s) are not designed to only hold a specific manufacturer's fire extinguisher. Verify the brackets are designed to hold the bottle securely during transport. (Section 3.6.4)

4.9.5. First aid kit. Verify the FSRS is equipped with a first aid kit that meets the specifications outlined in section 3.6.5.

4.9.6. Toxic Materials. Examine the material specifications for the container components and verify that in their cured, dried, or other final processed state they do not emit toxic vapors over time or otherwise present a health hazard to personnel during transportation, operation, or maintenance of the container. If the Government deems it necessary, the container will undergo a high-temperature storage test and the air will be sampled and tested in accordance with NIOSH-approved procedures for the material in question. Container materials that produce an accumulation of toxic vapors inside the container that exceed the NIOSH Threshold Limit Values for the substances present shall be cause for rejections. (Section 3.6.6.)

4.10. Economic Life. The contractor shall provide a report detailing why FSRS has a projected life of fifteen years or more. The projection may be made based on historical data regarding the economic life of items having similar design and manufacture, test data, or a combination thereof. Lack of supportive objective evidence in the report shall be a cause for rejection. (Section 3.7)

4.11. Reliability/Maintainability. The contractor shall provide an analysis demonstrating that the FSRS design does not degrade the inherent reliability/maintainability of the GFM container. (Section 3.8)

4.12. Ease of Maintenance.

4.12.1. Access. Using operators meeting the anthropometrical requirements of Appendix D of the SATS DFP 420, demonstrate that all preventative maintenance tasks, within reason, can be performed without dismounting the shop from its trailer and without removing or disassembling any part of the fire refill equipment. (Section 3.9.1.)

4.12.2. Fastening devices. Examine all removable fasteners on the FSRS and verify that all use some means of

keeping tightness and none are staked, swaged, or otherwise deformed. (Section 3.9.2.)

4.13. Logistical Support. Verification of the technical publications, supply support, and training aides identified in 3.10. shall be IAW section 4 of the applicable SOW. (Section 3.10.)

4.14. Warranty. Verify the warranties of all components are provided in accordance with manufacturing requirements as specified in section 3.12. (Section 3.11.)

4.15. FSRs equipment and tool load.

4.15.1. HFC-227 recharge station. Verify system included an HFC-227 recharge station. (Section 3.12.1.) Verify the recharge station is supplied with the maintenance kit outlined in section 3.12.1.1.

4.15.2. Recycled HFC-227 filter. Verify the system includes a recycled HFC-227 filter that meets the requirements outlined in section 3.12.2.

4.15.3. Scale with bottle holder. Verify the system includes a bench mounted scale with a bottle holder mounted to the weighing surface of the scale that meets the requirements outlined in section 3.12.3.

4.15.4. Work bench. Verify the system includes a work bench that meets the requirements outlined in section 3.12.4. Verify the work surfaces are corrosion resistant and do not react with any of the chemicals listed in section 3.6.7.

4.15.5. Bulk storage cylinder. Verify the system includes three empty bulk storage cylinders that meet the requirements outlined in section 3.12.5.

4.15.6. Nitrogen generator. Verify the system includes a nitrogen generator that meets the requirements outlined in section 3.12.6. Verify the nitrogen generator is supplied with a storage media that meets the requirements outlined in section 3.12.6.1.

4.15.7. Nitrogen regulator. Verify the system includes nitrogen regulators that meet the requirements outlined in section 3.12.7.

4.15.8. Down draft table. Verify the system includes a down draft table that meets the requirements outlined in section 3.12.8.

4.15.9. Bench scale. Verify the system includes a scale that meets the requirements outlined in section 3.12.9.

4.15.10. Dry chemical fill system. Verify the system includes a dry chemical fill system that meets the requirements outlined in section 3.12.10.

4.15.10.1. Dry chemical storage. Verify the dry chemical fill system is supplied with a dry chemical storage media that meets the requirements outlined in section 3.12.10.1.

4.15.11. Fire bottle storage rack. Verify the system is supplied with a fire bottle storage rack that meets the requirements outlined in section 3.12.11.

4.15.12. Pneumatic belt vise. Verify the system is supplied with a fire bottle storage rack that meets the requirements outlined in section 3.12.12.

4.15.13. Air compressor. Verify the system is supplied with an air compressor that meets the requirements outlined in section 3.12.13.

4.15.13.1. Electrical interfaces. If applicable, verify the air compressor is supplied with the proper electrical interfaces that meet the requirements outlined in section 3.12.13.1.

4.15.13.2. Mobility. If applicable, verify the air compressor is supplied with the proper equipment to meet the requirements outlined in section 3.12.13.2.

4.15.13.3. Hard Mounted Compressor. If applicable, verify the air compressor is supplied with the proper equipment to meet the requirements outlined in section 3.12.13.3.

4.15.14. Air regulator. Verify the system is supplied with the proper air regulators that meet the requirements outlined in section 3.12.14.

4.15.15. Dry chemical funnel attachment. Verify the system is supplied with a dry chemical funnel attachment that meets the requirements outlined in section 3.12.15.

4.15.16. Cylinder moving hand cart. Verify the system is supplied with a cylinder moving hand cart that meets the requirements outlined in section 3.12.16.

4.15.17. CO₂ Pump. Verify the container is supplied with one CO₂ pump. Verify the CO₂ pump operates on compressed air requiring no more than 16 CFM of air at 130 psi. Verify the pump outlet is adjustable with a maximum fill rate of no less than 10 pounds per minute. Verify the pump is equipped with fitting and parts that are resistant to corrosion including stainless steel piston sleeve(s), check valves, springs, and retainers. Verify the inlet is rated for 1400 psi and has a safety relief valve. Verify the pump does not require oil and is considered easily maintainable in the field or shop. Verify the pump is supplied with a minimum of four CO₂ adaptors that aid in the filling of a large majority of CO₂ fire suppression bottles. Verify the CO₂ pump is supplied with all of the hoses and connectors to allow the CO₂ pump to fill from a 75 pound or 100 pound high pressure supply cylinder. Verify the CO₂ pump is supplied with any tools that will be required for maintenance as well as the appropriate expendables that will be required for maintenance on the CO₂ pump and its associated equipment. Verify the CO₂ pump can fit, without hoses, in an envelope no larger than 15" x 14" x 11" and weighs no more than 45 pounds. Verify the CO₂ is supplied with a commercial warranty. (Section 3.12.17)

4.15.18. CO₂ cylinders. Verify the container is supplied with two CO₂ cylinders that meet the requirements outlined in section 3.12.18.

4.15.19. Fire refill Personal Protection Equipment. Verify the system is supplied with the proper Personal protection Equipment (PPE) that meets the requirements outlined in Table 1 in section 3.12.19.

4.15.20. Fire bottle maintenance tools. Verify the system is supplied with the proper fire bottle maintenance tools that meet the requirements outlined in Table 2 in section 3.12.19.

4.16. Inspection of packaging. The preservation, packing and markings shall be examined to determine compliance with the requirements specified in section 5.

5. Preservation and packaging.

5.1. Preservation, packing and markings. The preservation, packing, and marking requirements for the item identified above shall be accomplished in accordance with the performance requirements defined herein. The following Packaging requirements shall apply.

5.1.1. Packaging. Preservation, packaging, packing, unitization and marking furnished by the supplier shall provide protection for a minimum of one year, provide for multiple handling, redistribution and shipment by any mode, and meet or exceed the following requirements.

5.1.2. Cleanliness. Items shall be free of dirt and other contaminants which would contribute to the deterioration of the item or which would require cleaning by the customer prior to use. Coatings and preservatives applied to the item for protection are not considered contaminants.

5.1.3. Preservation. Items susceptible to corrosion or deterioration shall be provided protection by means of preservative coatings, volatile corrosion inhibitors, desiccants, waterproof and/or watervaporproof barriers.

5.1.4. Cushioning. Items requiring protection from physical and mechanical damage (e.g. fragile, sensitive, material critical) or which could cause physical damage to other items, shall be protected by wrapping, cushioning, pack compartmentalization, or other means to mitigate shock and vibration to prevent damage during handling and shipment.

5.2. Unit packaging. A unit package shall be so designed and constructed that it will contain the contents with no damage to the item(s), and with minimal damage to the unit pack during shipment and storage in the shipping container, and will allow subsequent handling. The outermost component of a unit package shall be a container such as a sealed bag, carton or box. Unit packs shall be designed to have minimum size and weight while retaining the protection required and enhancing standardization.

5.3. Unit package quantity. Unless otherwise specified, the unit package quantity shall be one each part, set, assembly, kit, etc.

5.4. Intermediate packaging. (as applicable) Intermediate packaging is required whenever one or more of the following conditions exist:

- a. the quantity is over one (1) gross of the same national stock number,
- b. use enhances handling and inventorying,
- c. the exterior surfaces of the unit pack is a bag of any type, regardless of size,
- d. the unit pack is less than 64 cubic inches,
- e. the weight of the unit pack is less than five (5) pounds and no dimension is over twelve (12) inches.

Intermediate containers shall be limited to a maximum of 100 unit packs, a net load of 40 pounds, or a maximum volume of 1.5 cubic feet, whichever occurs first.

5.5. Packing.

5.5.1. Unit packaging and intermediate packaging. Unit packages and intermediate packages meeting the requirements for a shipping container may be utilized as a shipping container. All shipping containers shall be the most cost effective and shall be of minimum cube to contain and protect the items.

5.5.2. Shipping Containers. The shipping container (including any necessary blocking, bracing, cushioning, or waterproofing) shall comply with the regulations of the carrier used and shall provide safe delivery to the destination at the lowest tariff cost. The shipping container shall be capable of multiple forklift moves from the front and rear of container, stacking at least ten feet high, and storage under favorable conditions (such as enclosed facilities) for a minimum of one year.

5.6. Unitization. Shipments of identical items going to the same destination shall be palletized if they have a total cubic displacement of 50 cubic feet or more unless skids or other forklift handling features are included on the containers. Pallet loads must be stable, and to the greatest extent possible, provide a level top for ease of stacking. A palletized load shall be of a size to allow for placement of two loads high and wide in a conveyance. The weight capacity of the pallet must be adequate for the load. The pallet shall be a 40 x 48 inch, 4-way entry pallet although variations may be permitted as dictated by the characteristics of the items being unitized. The load shall be contained in a manner that will permit safe handling during shipment and storage.

5.7. Marking.

5.7.1. Unit packages, intermediate packs, and exterior shipping containers. All unit packages, intermediate packs, exterior shipping containers, and, as applicable, unitized loads shall be marked in accordance with MIL-STD-129, Revision P Change Notice 4, dated 19 Sep 2007 including bar coding and a MSL label. The contractor is responsible for application of special markings as discussed in the Military Standard regardless of whether specified in the contract or not. Special markings include, but are not limited to, Shelf-life markings, structural markings, and transportation special handling markings. The marking of pilferable and sensitive materiel will not identify the nature of the materiel. Passive RFID tagging is required in all contracts that contain DFARS clause 252.211-7006. Contractors must check the solicitation and/or contract for this clause. For details and most recent information, see <http://www.acq.osd.mil/log/rfid/index.htm> for the current DoD Suppliers' Passive RFID Information Guide and

Supplier Implementation Plan. If the item has Unique Item Identifier (UII) markings then the UII needs to be 2D bar coded and applied on the unit package, intermediate and exterior containers, and the unit load.

5.8. Hazardous materials.

5.8.1. Hazardous material designation. Hazardous materials is defined as a substance, or waste which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated. (This includes all items listed as hazardous in Titles 29, 40 and 49 CFR and other applicable modal regulations effective at the time of shipment.)

5.8.2. Hazardous material markings. When applicable, the packaging and marking for hazardous material shall comply with the requirements for the mode of transport and the applicable performance packaging contained in the following documents:

International Air Transport Association (IATA) □ Dangerous Goods Regulations
International Maritime Dangerous Goods Code (IMDG) □
Code of Federal Regulations (CFR) Title 29, Title 40 □ and Title 49
Joint Service Regulation □ AFJMAN24-204/TM38-250/NAVSUPPUB 505/MCO
P4030.19/DLAM 4145.3 (for military air shipments).

5.8.3. Shipments originating outside US. If the shipment originates from outside the continental United States, the shipment shall be prepared in accordance with the United Nations Recommendations on the Transport of Dangerous Goods in a manner acceptable to the Competent Authority of the nation of origin and in accordance with regulations of all applicable carriers.

5.8.4. Product Material Safety Data Sheet (MSDS). Product Material Safety Data Sheets (MSDSs) are required to be included with every unit pack and intermediate container and shall be included with the packing list inside the sealed pouch attached to the outside of the package.

5.9. Heat treatment and marking of wood packaging materials. All non-manufactured wood used in packaging shall be heat treated to a core temperature of 56 degrees Celsius for a minimum of 30 minutes. The box/pallet manufacturer and the manufacturer of wood used as inner packaging shall be affiliated with an inspection agency accredited by the board of review of the American Lumber Standard Committee. The box/pallet manufacturer and the manufacturer of wood used as inner packaging shall ensure tractability to the original source of heat treatment. Each box/pallet shall be marked to show the conformance to the International Plant Protection Convention Standard. Boxes/pallets and any wood used as inner packaging made of non-manufactured wood shall be heat-treated. The quality mark shall be placed on both ends of the outer packaging, between the end cleats or end battens; on two sides of the pallet. Foreign manufacturers shall have the heat treatment of non-manufactured wood products verified in accordance with their National Plant Protection Organization's compliance program. In addition, wood used as dunnage for blocking and bracing, to include ISO containers, shall be ordered with ALSC certified marking for dunnage or the markings may be applied locally at two foot intervals.

5.10. Quality Assurance. The contractor is responsible for establishing a quality system. Full consideration to examinations, inspections, and tests will be given to ensure the acceptability of the commercial package.

5.11. SUPPLEMENTAL INSTRUCTIONS. Complete set shall be comprised of all components and accessories described in this DFP. The quantity per unit package for each component may be the quantity specified in the DFP unless otherwise noted. Military preservation, packing, and marking for each item identified in this DFP shall be accomplished in accordance with all the applicable requirements of MIL-STD-2073-1, Revision D, dated 15 Dec 1999 and MIL-STD-129P. Paragraphs 5.1 and 5.2 above apply to each component of the DFP for unit packaging. Each component unit package shall be marked (IAW) 4.1.1 of MIL-STD-129P. CAUTION; Use of preservative materials shall not apply to items in TABLE 1 of this DFP that provide life support (such as items designed for human intake of air, fluids, etc). Other items (such as hole punch, wrench, pliers, etc) not providing life support where permanent coatings (such as plating or paint) are present may receive applications of preservative coatings, volatile corrosive inhibitors, and desiccants, as corrosion protection, provided the method of preservation is easily removed with cleaners that will not cause harm or health issues to the user. Preservation of life support items in question shall be cleaned as needed and packaged in watervaporproof barriers without the use

of preservative like materials. Items of a delicate nature shall not be subjected to damage from rugged items contained within the set. Non-critical items of odd shapes or having sharp protrusions will not damage protective barriers.

Items of dissimilar metals subject to damage from electrolytic action shall be insulated with suitable material to prevent forming of galvanic corrosion.

Items within storage cabinets/organizers may not require packaging if placed in a dedicated position within the storage compartment, where there is no potential for corrosion or physical damage and can be identified by a layout plan. Individual items that are similar in nature shall be packed in close proximity to each other. Manuals shall be packed in sealed water proof packaging that is reusable, i.e. zip lock bag. Segregation of items within the set shall be accomplished by wraps, bags, dividers, boxes, container separation, tubes, skin or blister packs, sleeves or other approved means. Where large, heavy items are secured to container walls or floors by fasteners, bracing is recommended for the items or sections of load to hold in position and prevent shifting within the container. All items within the set shall be immobilized. Further production of all items, packing configurations, and markings supplied under this contract shall be identical to the first article.

A packing list is required for the entire set, 5.3.1 and 5.3.1.1 of MIL-STD-129P, to include GFE/GFM items. The ISO container shall serve as the shipping container. All GFE/GFM items shall be furnished with required UID as of 1 January 2006. If contractor receives GFE/GFM item without UID, contractor shall assign a UUI to the item(s). UID shall be placed in a conspicuous location for ease of visibility and free from damage.

The exterior unit pack shall be marked for handling to indicate the number of units that may be safely stacked on top of each other and to indicate that the load must be shipped and stored in the upright position only. The markings shall be large and clearly visible to a fork lift operator as he/she is handling the unit. The markings shall be "STACK NO MORE THAN X HIGH", X being the calculated number of containers not to exceed for stacking, and "THIS SIDE UP" with an arrow indicating the correct direction.

All items within the set exceeding 100 lbs that are not equipped with self supporting wheels shall be provided skids. Skid shall be designed to accommodate multiple forklift moves from the front and rear of unit. Skid planks will not protrude past the footprint of the load and load shall not extend past the edges of skid. Items placed on skids shall be secured to skid in accordance with FIG. 17 of ASTM-D4675.

When equipment is shipped with reservoir filled with recommended fluid to operating levels with all openings sealed, a tag will be placed at fill point to note fluid was added and indicate the fill date (FLUID ADDED, mm-dd-yyyy). When equipment is not shipped with fluid filled reservoir, and the proper quantity of fluid is provided, it will be contained and secured inside unit shipping container. A tag shall be placed at fill point of equipment noted (EMPTY, MUST ADD FLUID BEFORE USE). Markings are presented in CAPITAL LETTERS.

Packaging shall successfully pass test levels of ASTM D 4169, Distribution Cycle 18, Assurance Level I, Acceptance Criterion 3.

Testing shall be witnessed by the Government Quality Assurance Representative. Packaged gross weight and size shall be included on the test report as well as a detailed description of the packaging. The Contractor is exempted from testing if previous data for same or similar items can be provided (see Para. 5.6 of MIL-STD-2073-1D) and is acceptable to the Government.

Contractor shall furnish the Contracting Officer with shipping size and weight prior to shipment of first article. The nomenclature shall be omitted from outside of shipping container.

Appendix A: Government Design

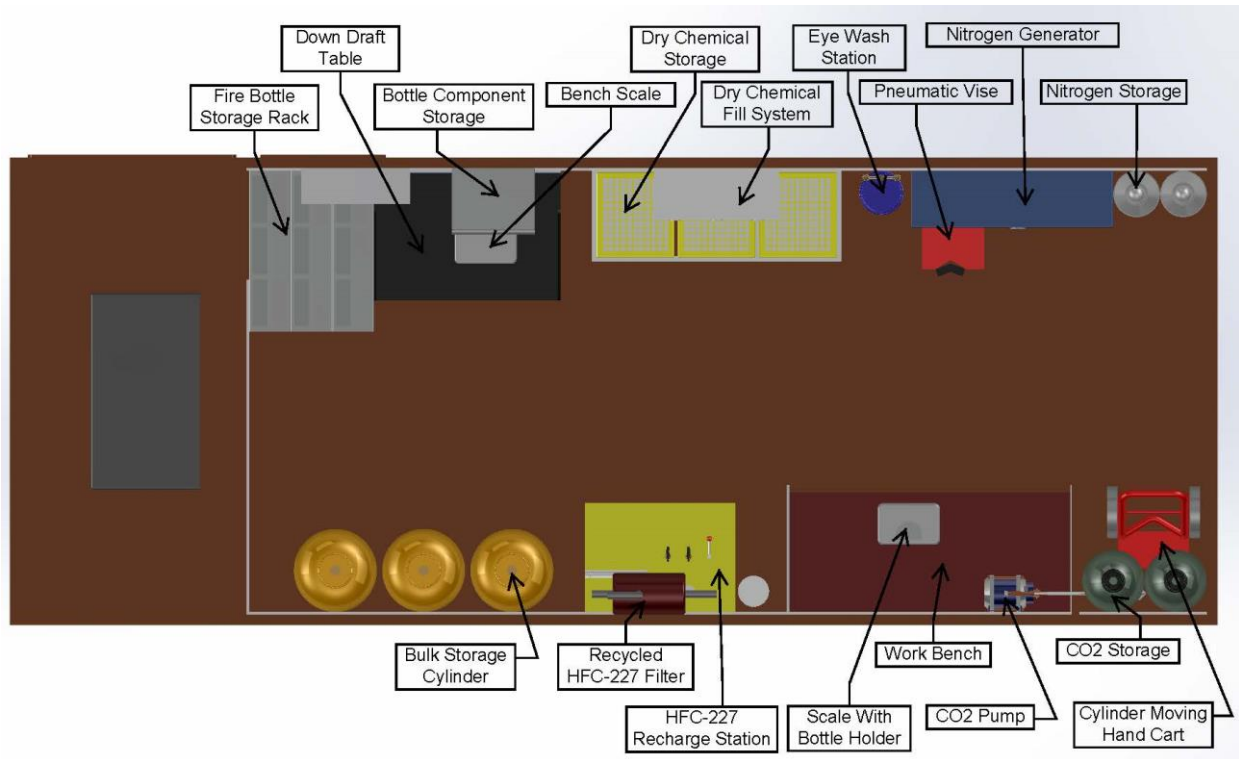


Figure 1: Top View of Government Prototype

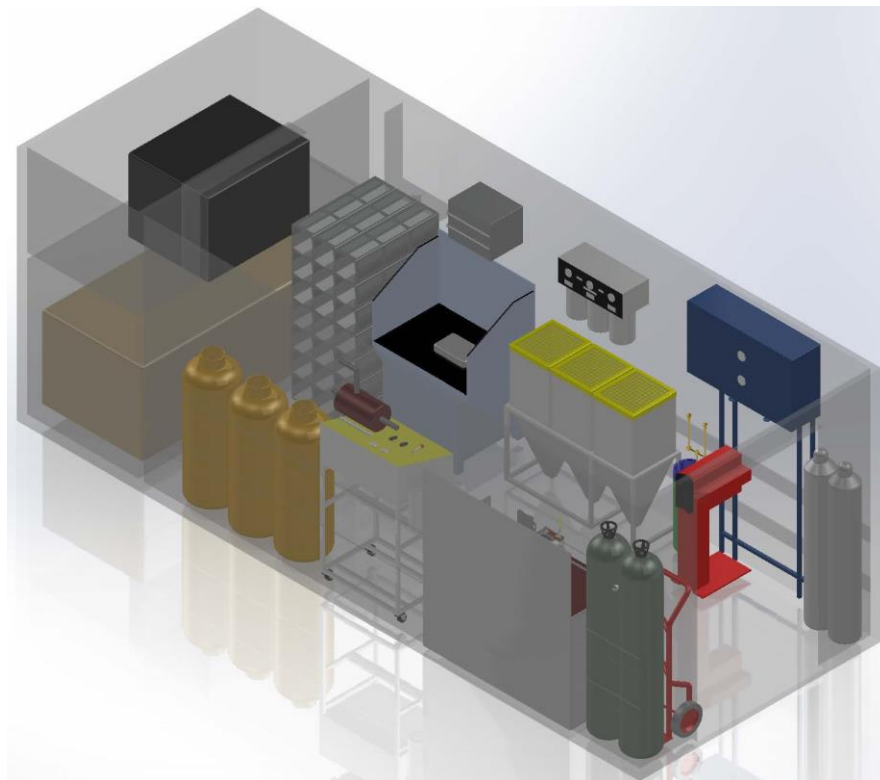


Figure 2: Isometric View of Government Prototype Interior

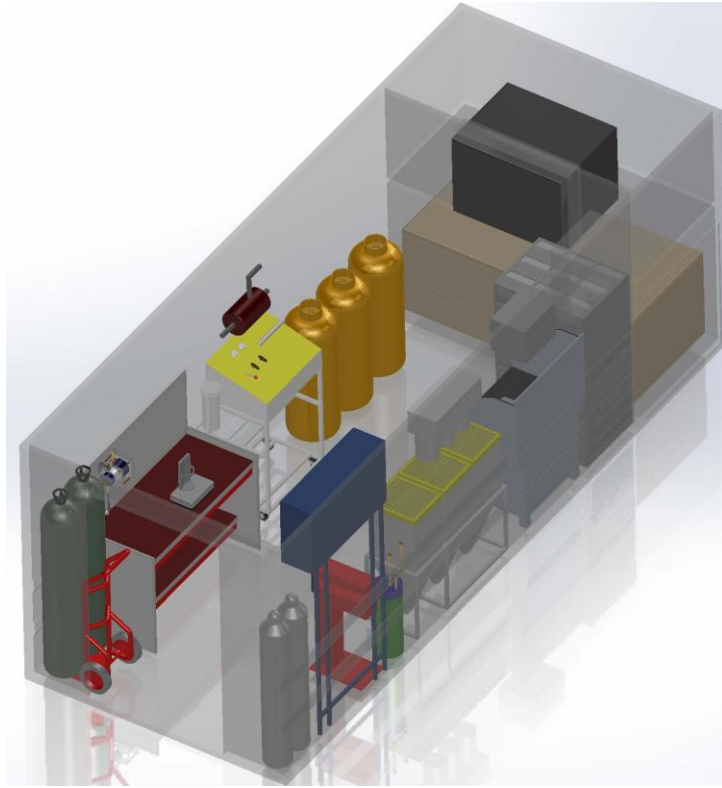


Figure 3: Isometric View of Government Prototype Interior



Figure 4: Location of Air/Electrical Pass Through

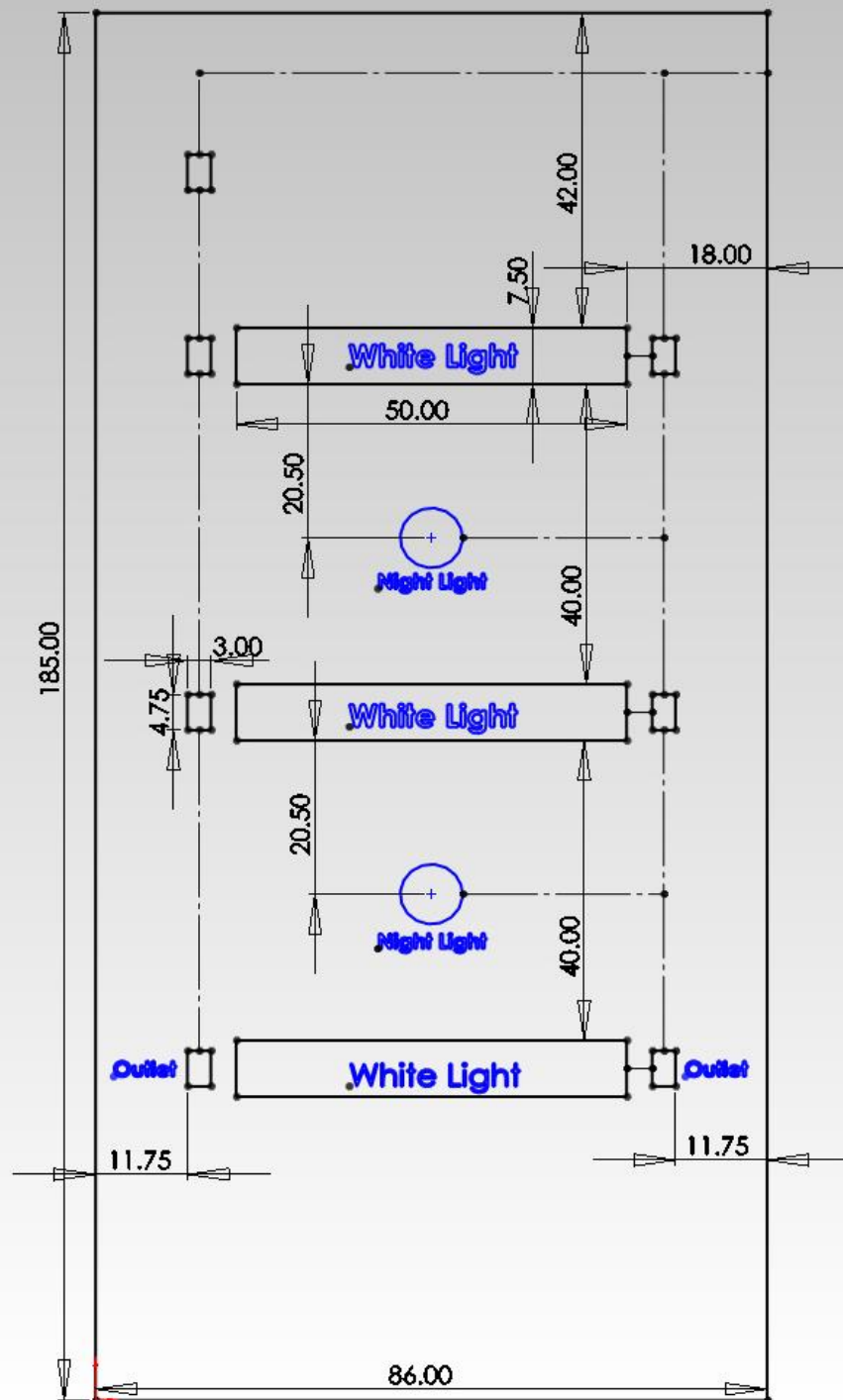


Figure 5: SATS Ceiling Electrical Layout

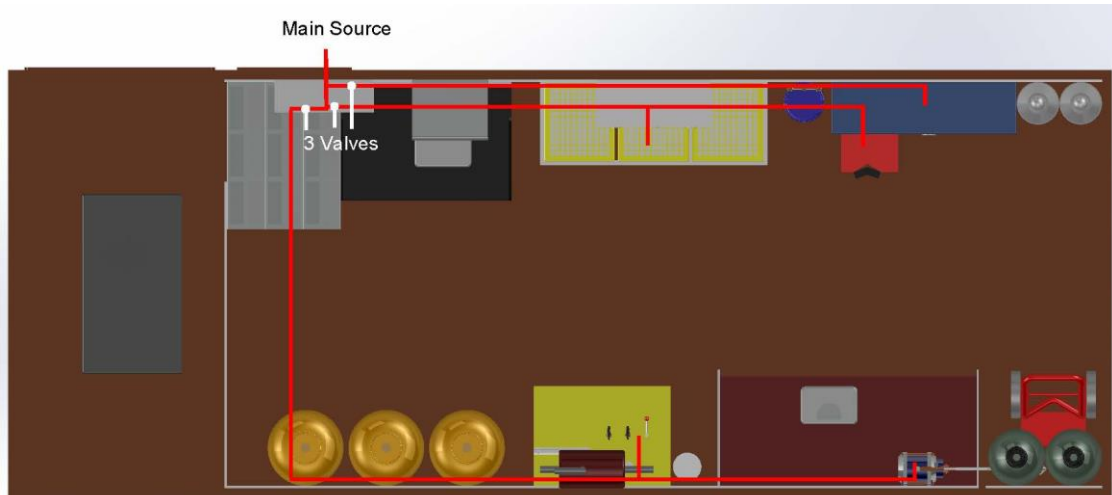


Figure 6: Possible Pneumatic Layout